The American Fruit Culturist.

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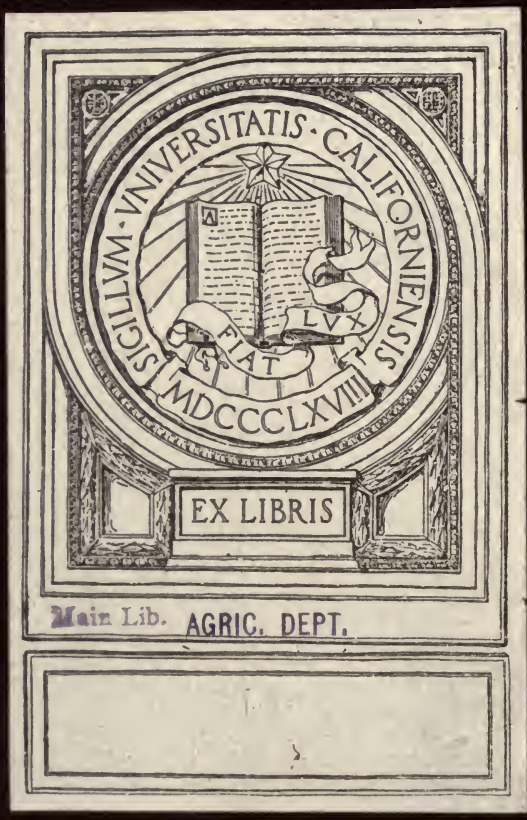

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THE

AMERICAN

FRUIT CULTURIST,

CONTAINING PRACTICAL DIRECTIONS FOR THE PROPAGATION AND CULTURE OF ALL FRUITS ADAPTED TO THE UNITED STATES.

BY

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A THOROUGHLY REVISED EDITION, ILLUSTRATED WITH FIVE HUNDRED AND EIGHT ACCURATE FIGURES.

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PREFACE

TO THE EIGHTH REVISED EDITION.

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The first edition of the Fruit Culturist, the basis of the present work, was written more than twenty years ago, and a year before the appearance of Downing's first edition of the *Fruits and Fruit Trees of America.* It was subsequently much enlarged, and several revised editions afterwards appeared. The rapid progress made of late years in the culture of fruit has required a still further revision. The present edition has been newly arranged, and most of it rewritten. Being intended as a guide to the practical cultivator, its object is to furnish useful directions in the management of the nursery, fruit-garden, and orchard, and to assist in the selection of the best varieties for cultivation. It does not claim to be a complete work on the pomology of the country, but aims to give full descriptions only of valuable or promising fruits suited to the country at large, or which may have been popular in certain districts. Varieties which are very little known, whose position or value is undetermined, or which have been found unworthy of further attention, are consigned to the general Descriptive List and Index, where their leading characteristics are briefly noticed.

As some confusion would result from a promiscuous assemblage of all the different varieties, a systematic arrangement has been adopted for the principal fruits.

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By placing them under separate and characteristic heads, the cultivator is enabled to distinguish and remember each sort with more readiness than where all are thrown indiscriminately together. The names of those fruits which have been proved of the greatest general value or which have received a large vote in their favor, either in particular regions, or throughout the country, are distinguished by being printed in small capitals. One of the chief points for determining the classification is the time of ripening; and the principal fruits are separated into summer, autumn, and winter sorts. As the time of ripening, however, varies several weeks in different parts of the country, and no exact line could be drawn for these three divisions, it would be strictly correct to classify them as *early*, *medium*, and *late*. With this understanding, however, the terms used will answer the purpose, and will not mislead.

The limits of the work, and the condensed character of the descriptions, have often forbidden a reference to authorities. A general acknowledgment, however, is due to the works of Charles Downing and P. Barry, of New York; of F. R. Elliott, of Ohio, and Wm. N. White, of Georgia; and to *Hovey's Magazine*, the *Gardener's Monthly*, the *Horticulturist*, and *Album de Pomologie*, for descriptions of new or rare varieties. The author is also specially indebted to Marshall P. Wilder, of Boston, President of the American Pomological Society; to Charles Downing, of Newburgh; and to Ellwanger and Barry, of Rochester, for much valuable information received in various ways.

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THE

AMERICAN FRUIT CULTURIST.

CHAPTER I.

INTRODUCTORY REMARKS.

IT is scarcely necessary at the present time, when so many are engaged in the culture of fruit-trees, to go into an argument to show its advantages. The most convincing proof is furnished by the fruit itself; whether it be from the single loaded plum or apricot-tree in the narrow yard of the townsman, or the broad orchard bending under the myriads of delicious specimens on the spacious grounds of the farmer.

The climate and soil of our country afford unequalled facilities for the cultivation of fruit. A rich treasure lies within the reach of its inhabitants, in the profusion of delicious kinds which successive months may be made to supply. Yet, but few have availed themselves fully of these advantages. Even the rapid increase of fruit culture within the past few years has but thinly spread its bounties over a widely-expanded and thickly-peopled territory.

In traversing the country, neat cottages and comfortable farm-houses are seen everywhere interspersed, and plenty is indicated by loaded orchards and abundant harvests. But how few of the prosperous owners are fully aware of the rare delicacies their fertile lands are capable of yielding. How many cultivate enough of the best peaches to obtain "from the loaded bough the mellow shower," for ten successive weeks? What number know that plums, rich, juicy, and bloom-dusted, may be had fresh from the tree, from early wheat-harvest till the ground freezes in autumn? Who among them par-

take of the fifty best melting pears, out of the thousand varieties which have fruited in this country? And, especially, who practically knows that a whole yearly circle of fruits is within his reach, beginning with the most refreshing strawberries, raspberries, and cherries, for early summer; including the richest plums, apricots, peaches, and nectarines, for summer and autumn; and closing with high-flavored pears, apples, and grapes, extending their season of ripening through all autumn and winter, and far into the succeeding spring? Happily, the number of cultivators is rapidly increasing, who may place upon their tables many delicious sorts, on almost any day of the entire year.

The cultivation of fruit has been retarded by a mistaken estimate of the time required for young trees to come into bearing. But this error is fast disappearing before skilful culture. It is become well known, that he who plants trees, plants for himself, as well as for his children. Bad treatment may long retard the growth and bearing of a tree. Enveloped in weeds and grass, what young plant could flourish? What farmer would think a moment of raising good corn in the thick and tall grass of a meadow? No wonder, then, that a young tree, similarly treated, lingers in feebleness and disease. But give it for a few years a mellow, clean, and fertile soil, and wide-spreading branches will soon bend under copious loads of fruit. To adduce instances: in a single garden, apple-trees, the fifth year from setting out, yielded a bushel each; peach-trees, the third summer, bore three pecks; and a Bartlett pear, two years from transplanting, gave a peck of superb fruit; none of them were an inch in diameter when transplanted, nor was their treatment better than that which every good farmer gives his carrots and potatoes.

The profits arising from the cultivation and sale of the best fruit are becoming well understood by skilful planters. Even under ordinary management, good apple orchards yield more than the best farm crops. From fifty to one hundred dollars per acre is a common yearly return; while to those who give their orchards the best attention in culture and pruning, and carefully thin out, assort, pack in the best manner, and ship to markets where their reputation is known, the finest sorts have often yielded an annual return of two to three hundred dollars per acre. With such fruits as strawberries, grapes, and pears, where more knowledge and skill are required in raising, picking, and marketing, still larger profits have been obtained. Strawberries, as commonly raised, bring an annual return of two or three hundred dollars per acre; but the best managers, who obtain large and delicious fruit by high culture, clipping the

runners, assorting and packing, and securing beforehand good markets, rarely fail of obtaining eight hundred to one thousand dollars. Isabella grapes have commonly yielded, by good management, a net profit of three to five hundred dollars annually, except in unfavorable seasons, and the Delaware a much larger sum. The pear crop, liable to many vicissitudes, has frequently yielded five hundred dollars, and sometimes even double this amount; and will doubtless continue to do so to those who understand the selection of the most productive and healthy sorts, and the proper treatment they require.

It is not, however, merely as a source of income that the cultivation of the finer kinds becomes profitable. The family which is at all times supplied with delicious and refreshing fruit from its own gardens, has within its reach not only a very important means of economy, but of real domestic comfort. An influence is thus introduced of an exalted character; a tendency is directly exerted towards the improvement of the manners of the people. Every addition to the attractions of home has a salutary bearing on a rising family of children. The difference between a dwelling with well planted grounds, and well furnished with every rural enjoyment, and another where scarcely a single fruit-tree softens the bleakness and desolation, may, in many instances, to a young man just approaching active life, prove the turning influence between a life of virtue and refinement on the one hand, and one of dissipation and ruin from the effects of a repulsive home, on the other. Nor can any man, even in the noon or approaching evening of life, scarcely fail to enjoy a higher happiness, with at least an occasional intercourse with the blossoming and loaded trees which his own hand has planted and pruned, than in the noise of the crowd and tumult of the busy world.

CHAPTER II.

LEADING PRINCIPLES OF THE GROWTH OF TREES.

THE formation of a large tree from a minute seed, is one of the most interesting and wonderful occurrences in nature. It is important that the fruit culturist should so understand the process as to know what will hasten it on one hand, or retard it on the other. By understanding these principles, the necessary rules will be greatly simplified, and the directions rendered more clear and obvious.

GERMINATION.

The first movement of the seed towards forming a new plant is termed *germination.* After the plant is formed, and its growth is carried on through the agency of its leaves, the process is termed *vegetation;* the latter immediately following the former.

To produce germination, seeds require heat, moisture, and air, but not light. It will be observed that these three requisites are present when seeds are slightly buried in moist, warm, mellow earth. Heat, although essential to all seeds, varies in the degree required by different species. The chickweed, for instance, will vegetate nearly down to the freezing-point; while tropical or hot-house plants often need a blood heat. Nearly every person has seen proofs of the necessity of moisture for the germination of seeds—indicated by the practice of watering newly-sown beds. The florist is aware that minute seed, which cannot be planted deep, as the portulacca, must be kept moist by a thin covering or shading. It is often requisite to bury seeds to a considerable depth, in order to secure a proper degree of moisture to start them. On the other hand, they will sprout on the surface unburied, if kept constantly showered.

The third requisite, *air*, is an important one. Seeds may be kept dormant a long time by deep burying. Nurserymen have often retained the vitality of peach-stones for a year or two, by burying them a foot or more in compact earth. Other seed might doubtless be kept for a time in the same way. Planting too deep is often fatal

to the success of a crop. The seeds of noxious weeds remain many years buried beneath the soil, until cultivation brings them up, mixes them with the soft mellow surface, accessible to air, when they spring up in profusion over the ground.

As a general rule, seeds germinate and grow most readily when buried to a depth of from three to five times their diameter, in soils of ordinary moisture.

In order to produce germination, moisture must find ready access to the interior of the seed. It is often excluded, if the coats have been allowed to become too dry. The thick coverings of the chestnut, horse-chestnut, and many seeds of similar character, if left a few days exposed to the air. become so hard as to prevent it. To secure success, they must be kept moist by imbedding them in moist sand, leaf-mould, or moss, from the moment they separate from the tree until planted in the earth. Apple seeds and some others, which have been allowed to become too dry, may frequently be started by scalding and then exposing them to the action of the frost; and by repeating the process several times, there is greater certainty of germinating. As the scalding and cooling must be quickly done, portions not larger than two or three pounds should be taken at a time. The object in cracking peach and plum-stones before planting, is to admit air and moisture—a process which is also hastened by subjecting them to freezing and thawing.

Fig. 1.

Cross-section of the sap-vessels of a young shoot of a peach, greatly magnified—a, bark; b, wood; c, pith.

The Structure of the Plant or Tree.—All plants, in the first place, are manufactured or built up of innumerable little cells, sacs, or cavities. These are usually not over a five-hundredth part of an inch in diameter, and in many plants they are still smaller. Fig. 1 exhibits a small part of the young shoot of the peach, cut across—the whole shoot presenting at least 10,000 of these little vessels, only visible under a good microscope. The branch of an apple-tree, an inch in diameter, cut across, shows about one million. This cellular structure exists throughout the roots, stems, shoots, leaves, flowers, and fruit.

The cells of plants usually vary from 1-300th to 1-500th of an inch in diameter, and it is obvious that during vigorous growth the plant must form them with great rapidity. A shoot of asparagus increases the length of one cell every ten seconds ; and as its diameter embraces many thousands, from fifty to a hundred million are formed every day. The building up of the plant of these cells has been compared to the erection of a house by the successive addition of bricks ; but if as many bricks were daily added to a structure, they would be enough to make a building daily larger than the great pyramid of Egypt, or the Coliseum at Rome. Yet every one of these cells is as perfect and finished as the finest work of art.

THE ROOT.

The root consists of several parts. The *main* root, called also the *tap* root, is the large central portion, extending downwards. In many plants or trees, however, it is divided as growth advances, until lost in *laterals* or side branches. The *fibres* or *rootlets* are the small thread-like roots proceeding from the laterals ; and lastly, and smallest of all, the new fibres are furnished with *root-hairs*, scarcely visible without a microscope. The whole surface of roots continue to absorb moisture from the soil so long as they are fresh and new ; and the newer portions, near the tips, absorb most freely. Old roots, covered with a hard or horny bark, imbibe almost none. The root-hairs convey moisture into the fibres with rapidity. Young trees, when dug up for transplanting, have most of the fibres and root-hairs torn from them, and they would suffer serious injury or die, but for the power which they possess of rapidly reproducing them under favorable influences.

The *collar* is the point of union between the root and the stem, but its place may be easily changed in many young plants by banking up the stem, which will emit new roots above. Or, a branch may be buried, as in layering grape-vines, honeysuckles, gooseberries, and many other woody plants. Small portions of roots attached to a graft will often produce a new plant ; this is especially the case with the grape and rose, which are extensively propagated in this way ; and also in some degree with the apple, of which, however, when thus root-grafted, larger portions should be employed of the roots of one-year, or at most two-year seedlings.

THE STEM AND BRANCHES.

As roots are *annual*, *biennial*, or *perennial*, as they continue living *one*, *two*, or more *seasons*; so the stem is *herbaceous* or *woody*, as it grows only one year or more—in the latter instance hardening into wood. Woody plants, when small, are called *shrubs*, as the rose, gooseberry, and currant. When large, they are trees, as the apple, pine, and oak. A dwarf apple, made small by budding any common variety on the small Paradise stock, becomes a shrub. *Suckers* are branches springing up from underground stems; sometimes they come from mutilated roots. Runners are creeping stems, which strike roots at the tips and form leaves there, as in the strawberry. A single strawberry plant will in this way produce a hundred new ones or more in a summer; and by care ten thousand by the end of the second year, a million the third, and so on.

Outside-growing woody stems (or those which are two-cotyledoned) are made up of the bark, wood, and pith. The *liber*, or inner bark, lies next the wood; and the rind or outer bark, on some trees, forms gradually into a thick, hard, corky substance, termed *cortical layers*. When young it is the *green bark*, and performs an office in the growing plant similar to that of the leaves. The sap descends from the leaves through the inner bark, and deposits new layers of both wood and bark yearly. Thus the newest bark is inside, and the newest wood outside.

Wood. The outer wood, which is the youngest and freshest, is called the alburnum or sap-wood. The heart-wood is the older, harder, and usually more dried portion; and it bears the same relation to the sap-wood, as the cortical layers do to the liber. The *pith*, in young plants, performs a useful office by retaining moisture; but in old trees it becomes dry, shrivelled, and useless, and trees grow as well where it has been cut out.

Branches. These consist of *main branches*, or limbs; *secondary* or smaller branches; and *shoots*, or the extremities, being one year's growth. *Thorns* are a modification of branches, and are sometimes simple, as in the common thorn; or branched, as in the honey-locust. Ungrafted pear-trees often present all the intermediate forms between perfect branches and perfect thorns. *Prickles* grow only from the bark, and when the bark is stripped off they are all taken off with it; but thorns remain attached to the wood.

Buds are of two kinds, *leaf* and *flower*. The former grow into branches, the latter produce fruit. To distinguish these buds is of great importance to the cultivator of fruit-trees. In Fig. 3, A repre-

sents a portion of the branch of a pear-tree, and *b*, *b*, *b*, are flower or fruit-buds on the extremities of short spurs termed fruit-spurs; and *c*, is a leaf-bud on a one-year shoot. B exhibits these two kinds of buds as seen on the cherry, *b*, *b*, being the rounded fruit-buds, and *c*, *c*, the sharper leaf-buds.

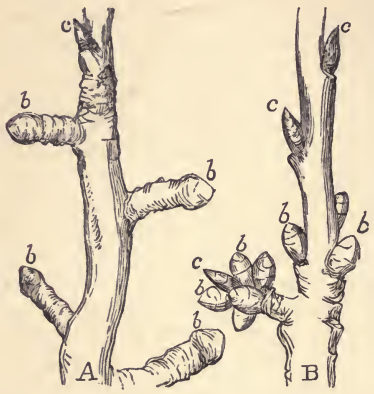

Fig. 2. Fig. 3.

Leaf and flower buds. b, b, flower buds; c, c, leaf buds.

Causes of this difference. When young trees grow rapidly, all their buds are leaf-buds; when they become older and grow more feebly, many of them become flower or fruit-buds. One is the result of rapid, and the other of slow growth. Check the growth of a young tree by transplanting it, or by root-pruning, or by neglecting cultivation, or allowing it to grow with grass, and many fruit-buds will be found upon it, and it will bear early. But as the growth is unnaturally enfeebled, the fruit is not always of the best quality. The natural diminution of vigor from increased age furnishes better fruit. Fruit-buds are likewise produced by checking the free flow of the sap in grafting on dissimilar stocks; as, for example, the pear on the quince, producing dwarf pear-trees. The fruit-spurs shown by A, Fig. 2, are nothing more than stunted shoots, originally produced from leaf-buds, but which, making little growth, have become fruit-bearers. The vigorous one-year shoot of the cherry, B, is mostly supplied with leaf-buds, but the short spurs on the second year's wood, which are but dwarfed branches, are covered with fruit-buds, with only a leaf-bud in the centre.

It is not, however, always the slowest-growing kinds of fruit-trees that bear soonest. There appears to be a constitutional peculiarity, with different sorts, that controls the time of beginning to bear. The Bartlett, Julienne, and Howell pears, vigorous growers, bear much sooner than the Dix and Tyson, which are less vigorous.

By pruning away a part of the leaf-buds, the fruitfulness of a tree may be increased; and by pruning away the fruit spurs, bearing may be prevented, and more vigor thrown into the shoots.

Buds are *lateral*, when on the side of a shoot; and *terminal*, when on the end. Terminal buds are nearly always leaf buds, and usually being larger and stronger than others, make stronger shoots. All buds are originally formed as leaf buds, but the more feeble are generally changed to fruit buds. Now, it happens that on many kinds of trees, the feebler buds are on the lower parts of shoots (by *lower* is meant furthest from the tip), and these consequently often change to fruit-buds. This change in some kinds of trees, as cherry and plum, takes place the year after they are formed; and in others the same year, as, for instance, in the peach and apricot. This transformation is a very curious process, and is effected by the embryo leaves changing to the organs of the flowers. A contrary change of stamens to flower leaves produces double flowers.

Latent Buds. Only a small proportion of all the buds formed grow the second year; the rest remain dormant or latent for years, and are made to grow and produce shoots only when the others are destroyed.

Adventitious Buds are produced by some trees irregularly anywhere on the surface of the wood, especially where it has been mutilated or injured; and they form on the roots of some trees which are cut or wounded. In these cases such trees may be usually propagated by cuttings of the roots.

Leaves. These are commonly made up of two principal parts, viz. the *framework*, consisting of the leaf-stalk, ribs, and veins, for strengthening the leaf, and supplying it with sap; and the *green pulp*, which fills the meshes or interstices. The whole is covered with a thin skin or *epidermis*. The green pulp consists of cells of various forms, with many air-spaces between. The cells are commonly placed very compactly together on the upper side of the leaf, and more loosely, or with air-spaces, on the lower side—hence the reason that leaves are usually lighter-colored below. Fig. 4 is a highly magnified section of a leaf, showing the green cells, air spaces, and epidermis above and below. Leaves have also *breathing pores*, through which moisture and air are absorbed, and vapor given off. They are so small as to require a good microscope to discover them; and they vary in different plants from 1,000 to 170,000 on a square inch of surface. The apple and

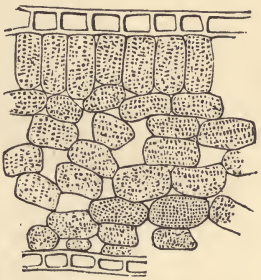

Fig. 4.
Magnified cross section of leaf.

pear have about 25,000 or 30,000, and the white lily about 60,000 to the square inch. They are mostly on the lower side of the leaf. Fig. 5 represents the pores on an apple-leaf. Leaves are a contrivance for increasing the surface exposed to the air and sun. Prof. Gray says the Washington elm at Cambridge was estimated to bear "seven million leaves, exposing a surface of 200,000 square feet, or about five acres of foliage." A common fully grown apple-tree has from three to five hundred thousand leaves, and the breathing pores they all contain must be more than a thousand million.

Fig. 5.

THE PROCESS OF GROWING.

Water is absorbed by the roots, and undergoes a very slight change; matter from the cells of the root is added (as sugar, in the maple), and it is then denominated *sap*. It passes from cell to cell upwards, through the sap-wood, until it reaches the leaves. The cells being separate, and not continuous tubes, it is conveyed from one to another through a great number of partitions; in the basswood, for example, which has very long cells, it passes about 2,000 partitions in rising a foot.

When the sap enters the leaf, it emerges from the dark cells through which it has been passing, and is spread out to the light of the sun. A large portion is evaporated through the breathing pores, and it becomes thickened. The carbonic acid of the air, and the small portion of the same acid which the sap contained before it entered the roots, now forms a combination with the oxygen and hydrogen of the sap, and produces the triple compound of oxygen, hydrogen, and carbon, which constitutes woody fibre—the oxygen of the carbonic acid escaping. This escape of oxygen may be seen by placing leaves under water in the sunshine. Innumerable little bubbles of oxygen form on the surface of the leaves, and give them a silvery appearance. If continued, air-bubbles rise in the water, and if a glass tumbler full of water is inverted over them, pure oxygen in small quantities may be procured. A plant growing in carbonic acid gas, takes the carbon, and leaves the oxygen; in this way changing the acid to oxygen. Growing plants thus perform a most important office by purifying the atmosphere. Fires in burning, and animals in breathing, consume carbon, combine it with oxygen, and then throw off the carbonic acid thus formed. This acid, being poisonous, would after a while become so abundant as to prove injurious to animal life, were it not for the wise provision by which

plants consume it and restore the oxygen. Connected with this, there is another interesting proof of creative design. If there were no carbonic acid in the air, plants could not grow; but one-twenty-five-hundredth part, as now exists, supplies food for vegetation, and does not affect the health of animals and man.

Leaves require sunlight to enable them thus to decompose carbonic acid. It does not go on in a dark room, or in the night. An excess of oxygen in a plant makes it pale in color, and either sour or insipid in taste; an excess of carbon makes it dark green, high-flavored, or bitter. Hence, a potato growing in a dark cellar is pale or white; hence the process of blanching celery and sea-kale to remove the bitter taste. Hence also the reason that a potato much exposed to the sun imbibes too much carbon, and becomes bitter. Hence, too, strawberries and other fruits are more acid when hidden by leaves or in cloudy weather; and apples on the thickly-shaded part of an unpruned tree are more sour and imperfect than where, by good pruning, the leaves which feed them are fully exposed to the light, and receive a proper share of carbon.

The sap, thickened, reduced in bulk, and prepared in the leaves, then descends through the inner bark, forming a layer of fresh, half-liquid substance, between bark and wood, called the *cambium*—most of which, by hardening, constitutes a new layer of wood—a small part making a new layer of bark. The annual deposits of new wood form distinct concentric rings, by which the age of the tree may be counted when the trunk is cut through. That this is the mode by which wood in exogenous trees is deposited, may be proved by an interesting experiment, performed by slitting the bark of a young tree, lifting it up carefully, and then slipping in between wood and bark a sheet of tin-foil, and binding the bark on again. The bark will deposit layers of wood *outside* the tin-foil, and none inside; and after a lapse of years the concentric rings will be found to correspond exactly with the time since the operation was performed.

The descent of the forming wood in the inner bark may be shown by tying a ligature around a growing branch, or by removing a ring of bark. The downward currents are obstructed, like that of a stream by a dam, and the new wood accumulates above the obstruction, and not below, as shown in Fig. 6.

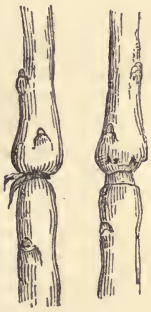

Fig. 6.

In Grafting, it is essential that some portions of the cut surfaces uniting the stock and shoot should

be placed so accurately together that the sap may flow up through the alburnum or sap-wood from the stock to the shoot, and back again through the inner bark of the shoot to that of the stock. When this union takes place, the rest of the cut faces, even if some distance apart, are soon cemented by the newly-forming wood, which fills all the vacant space.

In Budding, the newly-set bud is cemented to the wood of the stock by the cambium, which hardens and fastens it. The next spring the bud grows, forms a shoot, and the two portions become securely united by the new wood. Unless there is enough of the cambium to cement the wood to the stock, the operation cannot succeed; and this is the reason why, with vigorously growing stocks, which are depositing much, budding succeeds better than with feeble growers, where but little of this cement exists.

The rapidity with which leaves exhale moisture, is shown by severing them from the stem in dry weather. They soon wither and become dry. Cut a shoot from a tree, and throw it down in the sun's rays, and it will quickly shrivel, in consequence of the rapid escape of its moisture through the leaves. But first cut off all the leaves, and the shoot will remain plump a long time. This is the reason that it becomes necessary to remove the leaves at once from scions cut for budding.

Hence also the reason that plants and trees are so liable to die if transplanted with the leaves on, a disaster which may be partially prevented in trees by removing the leaves; and in plants or cuttings with leaves on, by covering them immediately with a bell-glass, which, by holding the watery vapor, keeps a humid atmosphere about them. It is for this reason, also, that when young trees lose a large portion of their roots, a part of the top must be cut off, to prevent the heavy evaporation which all the leaves would occasion.

A sunflower plant, about three feet high, was found to exhale from its leaves in very dry weather between one and two pints of water in a day. A bunch of growing grass placed beneath a cool inverted glass, soon covered the sides of the glass with condensed drops from the vapor, and in a few minutes the water ran down the sides. These experiments show the great amount of water needed by growing plants; and also prove the mistake which some persons commit, by leaving weeds to grow to shade the ground and keep it moist, while these weeds are actually pumping the water rapidly up from the soil, and dissipating it through their leaves.

The absolute necessity of leaves to the growth of a tree is shown by the fact that when they are stripped off by caterpillars, the tree

ceases to grow till new ones expand; and if often repeated it perishes. When the leaves of young pear-stocks cease to act, in consequence of leaf-blight, the tree no longer grows; cambium ceases to form, and they cannot be budded. An interesting illustration of the office of leaves occurred to the writer a few years since: A yellow gage plum-tree set a heavy crop; but when the fruit was nearly grown, all the leaves dropped. The fruit remained green, flavorless, and stationary, until a new crop of leaves came out. It then finished growing, acquired a golden color, and a rich, excellent flavor.

Perfect fruit requires perfect leaves; and thick, crowded, half-grown leaves, give small fruit with poor flavor. The great object of pruning, and of summer pruning especially, is to give plenty of good, healthy, and not crowded foliage, and the crop will also be good.

The *green bark* of trees and plants performs an office similar to that of the leaves; and in connection with the cells adjoining, appears to fulfil sometimes an office which the leaves fail to accomplish. This is, *preserving the identity of the species or variety.* For example, bud a *pear*-tree on a *quince.* All the wood above the place of union will be pear-wood; all below will be quince. All the supplies which come from the pear-leaves change to quince-wood the moment they pass this point; and if the budding is performed when the quince-stock is smaller than a quill, yet all the wood below, when it becomes a large tree, will still be perfect quince-wood, as is shown when any chance shoots or suckers spring up from below. Or bud, for example, the Northern Spy, which has dark bark, with the Bellflower, which has yellow; and again, bud the snow-apple, which has dark-colored bark, on the Bellflower, and the light-colored Sweet Bough on this—each being an inch above the last budding. Successive dark and light bark, the peculiarity of each variety, will remain as long as the tree grows; showing conclusively that the bark performs the finishing process in the manufacture of the new wood.

FLOWERS.

The object of the flower is the production of seeds, and through them the reproduction of new plants. The protecting organs of each are, the calyx outside, which is usually, not always, green; and the *corolla*, or flower leaves, of various colors, which are next within

the calyx. The *essential* parts of the flowers are the *stamens* and *pistils*. Fig. 7 represents an enlarged flower of the cherry, cut through the middle, showing the small calyx, the large corolla, the many stamens, and the single pistil. Fig. 8 is a magnified flower of the purslane, showing several pistils. The head of the stamen (*b*, Fig. 9) is called the anther. It contains a powder called *pollen*, which is discharged by the bursting of the anther, the pollen being the fertilizing matter, essential to the production and growth of the new seed. The thread-like stalk of the stamen (*a*) is called the *filament*. The pistil (Fig. 10) consists of the *stigma*, *c*, at the top; the *style*, *b*, its support; and the *ovary*, *a*,

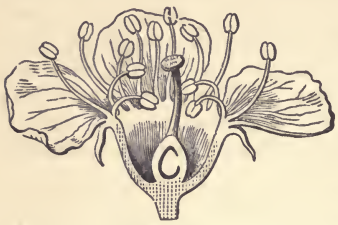

Fig. 7.
Flower of the cherry.

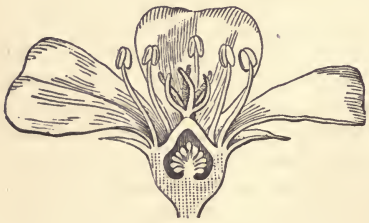

Fig. 8.
Purslane flower.

Fig. 9.
Stamen.

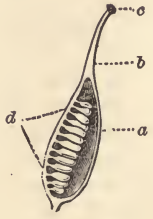

Fig. 10.
Pistil.

or future seed-vessel. The *ovules*, *d*, are the rudimentary seeds. The pollen of the stamens falls on the stigma, and the ovules are fertilized or impregnated, and become seeds.

Sometimes the stamens and pistils are in different flowers, on different parts of the plant. A familiar instance occurs in Indian-corn, the "silk" being the pistils, and unless these are impregnated by the pollen of the anthers at the top, no grains of corn will be produced.

Sometimes the staminate and pistillate flowers are not only separate, but are on distinct plants, as the Buckthorn and Hemp. The pistillate flowers are said to be *fertile*, and the staminate *sterile*, and both must be planted near each other in order to obtain fruit or seed.

Sometimes the stamens, when not absent, are so defective that they cannot fertilize the pistils, or but imperfectly. This is the case with what are termed pistillate strawberries; such, for example, as Hovey's Seedling and Burr's New Pine. In order to produce good crops, some other variety that has perfect flowers or perfectly developed stamens, as the Scarlet, or Wilson, must be planted near, from which the wind may waft, or the bees carry the pollen to the imperfect flowers. Fig. 11 represents the flower of a staminate strawberry, or one where stamens as well as pistils are perfect; Fig. 12 is a pistillate flower, the stamens being small, and containing but little pollen in the anthers. Fig. 13 is an

Fig. 11. *Staminate flower.*

Fig. 12. *Pistillate flower.*

Fig. 13. *Stamens of Scarlet Strawberry.*

Fig. 14. *Stamens of Hovey's Seedling.*

enlarged view of the former, *a* being the stamens, and *b* the pistils. Fig. 14 is a flower of Hovey's Seedling, showing at *a* the dwarfed and useless stamens. Sometimes very favorable circumstances will enable these dwarfs to afford a portion of pollen, and berries will be produced, even if they are remote from other fertilizing varieties.

SPECIES AND VARIETIES.

Plants and animals of one species are supposed never to produce a progeny of a different one, no matter how many successive generations may intervene. Thus, for example, the seed of a pear never produces an apple, these being distinct *species;* but it gives many different sorts of pears, which are only *varieties.* So the apple produces innumerable varieties, but it can never yield a pear, a quince, or a peach.

The knowledge of the character of species, and their affinities, would frequently prevent the blunders which grafters commit, in trying to make the peach grow on the willow or butternut.

CHAPTER III.

PRODUCTION OF NEW VARIETIES.

THE tendency is more or less common with all plants, when successively produced from seed, to depart from the character first stamped upon them. These departures give rise to new varieties. This tendency to vary is increased as plants are removed from their native localities; and in an eminent degree by cultivation. Planted in gardens, and subjected to high culture, repeated and successive sowings often develop striking changes in those which for previous centuries had remained unchanged. By a constant selection of seeds from the best, a gradual improvement on the original is effected. Most of our finest fruits doubtless owe their existence to this improving process.

While a few of the seedlings from such improved varieties may become still further improved, a far greater number will probably approach towards the original or wild state. The more highly improved the fruit, the greater the difficulty to find one of its progeny which shall excel or equal the parent. In ten thousand seedlings from those high-flavored apples, the Swaar and Esopus Spitzenberg, it may be quite doubtful if any shall equal in quality those fruits themselves, while most may fall considerably below them.

The improvements effected in former ages were doubtless the result of accident, as the ancients were ignorant of the means for their systematic accomplishment. The greatest progress in the art made in modern times was effected by Van Mons in Belgium, and Knight in England.

Van Mons, who directed his labors chiefly to the pear, obtained many new and excellent varieties, by a constant and successive selection of the best seedlings. He first made a large collection of natural stocks, or wild pears, choosing those which, from the appearance of the wood and leaf, he had reason to believe would be most likely to give the best fruit. As soon as the first of these bore, he selected the best, and planted the seeds. Selections were again

made from the first of these, and so on in continued succession; the best and soonest in bearing were uniformly chosen. He thus obtained fruit from the eighth generation; each successive experiment yielding an improved result on the preceding. He had, in the early part of this series of experiments, no less than eighty thousand trees; hence, in selecting from so large a number, his chance for fine sorts was far greater than from a small collection; and hence too the reason why, after seven or eight improving generations, he had obtained so many good varieties. In the early stages of his operations, he found "that twelve or fifteen years was the mean term of time, from the moment of planting the first seed of an ancient variety of the domestic pear, to the first fructification of the trees which sprang from them." When his seedlings were at the age of three or four years, he was able to judge of their appearances, though they had not as yet borne; such only were taken for further trial as exhibited the strongest probability of excellence. It is hardly necessary to remark that in all these trials, the young trees were kept in the highest state of cultivation.

Van Mons maintained that by selecting and planting the seeds of the first crop on the young tree, the product would be less liable to run back to the original variety than where the seeds were taken from the fruit of an old-bearing or grafted tree; and to this practice he chiefly ascribed his success. The many instances, however, of fine seedlings from old grafted sorts, throw a shade of doubt over this theory. There is scarcely a question that the same extent of labor expended in crossing varieties, would have given greater success.

NEW VARIETIES BY CROSSING.

New varieties are produced in crossing by fertilizing the stigma of one with the pollen from another, as described in the preceding chapter. The simplest instance which occurs is that of the strawberry, the pistillate varieties of which must always be impregnated with pollen from staminate sorts. Thus the seed obtained from the berries of every pistillate strawberry are crosses, and if planted will produce new varieties. In fruit-trees, the stamens and pistils are in the same flower, and the chances of accidental mixture from other trees become very small, unless effected by insects, which, becoming thickly dusted with powder from one flower, plunge into the recesses of another, and effect a cross-fertilization. Where many varieties grow in one garden, in close proximity, cases of promiscu-

ous intermixture are constantly occurring. The crosses thus produced are shown only by raising fruit from the seedlings.

In the annexed figure of the pear-blossom (Fig. 15), the five central organs, *a*, are the *pistils*; the upper extremity of each is the *stigma*. The surrounding thread-like organs, *b*, are the *stamens*, surmounted by the *anthers*. When the flowers open, the anthers burst, and discharge the pollen on the stigma, which operates on the embryo fruit at its base.

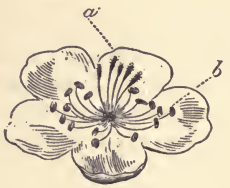

Fig. 15.

Flower of the pear—a, stigmas; b, anthers.

Fig. 16.

Flower of the pear, with the anthers cut out.

The production of new varieties is greatly facilitated by cross-impregnation, or by fertilizing the pistil of one variety with the pollen of another. This was performed with great success by Knight. Selecting two varieties, while yet early in flower, and before the anthers had burst and discharged the pollen, he cut out with a fine pair of scissors all the stamens, leaving the pistils untouched (Fig. 16). When the stigma became sufficiently mature, which was indicated by its glutinous surface, he transferred the pollen of the other sort on the point of a camel's-hair pencil. Some propagators prefer the point of the finger for applying the pollen. The fruit, thus yielded, was unchanged; but its *seeds* partook variously of the nature of both parents, and the trees growing from them bore new and intermediate varieties.

For the success of such experiments, several precautions are requisite. The flower must be deprived of its stamens before it has fully expanded, or before the anthers have already burst and scattered their dust; the pollen must be procured from a bursting or fully matured anther, when it will be dry and powdery; the stigma must be inoculated as soon as it becomes adhesive or glutinous, otherwise it may be fertilized from another source, and then the intended pollen cannot possibly take effect. For, a stigma once inoculated, cannot be inoculated again It is safest, where practica-

ble, to force the trees by artificial heat into flowering a few days earlier than others, so as to be secure from accidental inoculations of pollen floating in the air; and to prevent its spread by bees, to apply a temporary covering of gauze, or thin oil-cloth. A want of attention to these minutiæ has led some experimenters to fancy they had obtained crosses, when they had only natural seedlings.

To obtain new varieties of certain desired qualities, select two which possess those qualities separately, and seedlings from crossing will be likely to exhibit these qualities combined. Thus, a very early pear deficient in flavor, as the Amire Joannet, might furnish one of superior quality by a cross with a better and later sort, as Dearborn's Seedling. Or, a small and very rich pear, as the Seckel, might give us one of the larger size by fertilizing the Bartlett. A slow-growing and tender peach, as the Early Anne, might be rendered hardier and more vigorous by an intermixture with the Early York or Cooledge's Favorite. But it must be remembered, that there is a tendency in such highly improved sorts to deteriorate, and that out of thousands of seedlings, perhaps only one or two may be fully equal to the original.

The following mode of raising crosses of the grape is described by G. W. Campbell, who has experimented largely:

"To be certain of success, the grape blossom must be opened artificially, before its natural period of flowering, and all the anthers or stamens removed before the pollen or fecundating dust is formed, leaving only the bare germ, with the stigma unfertilized. To prevent the possibility of impregnation by bees or insects, or the wind conveying pollen from other sources, the prepared blossom-bunch is inclosed in a tight, oil-silk case, and pollen supplied at the proper time from whatever variety it is proposed to cross, or hybridize with. When the berries swell, and commence growing, it is an indication that the process has been successful; and the oil-silk covering may then be removed, the bunch carefully labelled, and the seeds from these berries, when planted, are expected to produce crosses or hybrids having characteristics of both parents.

"I have also tested the accuracy of my experiments in various ways. In one instance I prepared a bunch, as if for crossing, by removing all the stamens, and inclosed it in the usual manner, but applied no pollen. Upon removing the covering some days after, every berry but one had blasted, and fell off at a touch. This one berry, being from some cause later than the rest, was just in condition to receive pollen, which I supplied from the Chasselas Musqué, and produced a grape, from which I have a seedling that may prove

valuable. Other bunches, prepared at the same time, upon the same vine, and supplied with pollen at the proper time, were all fertilized, and produced full and perfect bunches. The Logan and Taylor's Bullitt both set their fruit unevenly and imperfectly, and produce usually small, straggling, and unhandsome bunches. When fertilized in the manner above stated they have produced handsome and compact bunches, the only ones of that character upon the vines.

"Seedlings almost uniformly indicate their parentage by their foliage. That of hybrids with the foreign vines is usually deeply lobed; often having much more the form of the foreign than the native leaf, although grown from the seed of the native parent Some have foliage intermediate or resembling both in some degree. Also, in the crosses between natives, some resemble one parent and some the other. Others again seem a mixture of both."

An easier process is to plant them in close contact, so that the fruiting branches may intermingle. Out of a large number of seedlings thus obtained, there is a chance of a fair portion of them being crosses. It was in this way that Dr. Kirtland produced the seed of all his new and excellent varieties of the cherry.*

When a cross is obtained between two different *species*, instead of between mere varieties, it is termed a *hybrid*. But while varieties of the same species intermingle freely, the operation rarely succeeds between fruits of different species. The gooseberry, currant, and black currant, species of the same genus, and nearly related, have never produced a hybrid. Neither has any ever been obtained between the apple and the pear, or the pear and the quince. But different species of other plants, as the Heaths, and some of the Cacti, intermingle freely. The Rhododendron will fertilize the Azaleas, and the Red Cedar has been made to inoculate the American Arbor-vitæ, though both these examples are between plants of different genera. Hybrids are frequently sterile; or if they possess the power of reproduction by seed, the progeny returns to the state of one or the other of its parents.

* The interesting fact that fruit trees which grow alone and distant from any other sorts, are more apt to reproduce these sorts from seed with but little variation, than seeds from the same sorts in mixed orchards, shows to what extent the spontaneous crossing or mixture of varieties may be constantly going on in such orchards.

CHAPTER IV.

PROPAGATION BY BUDDING AND GRAFTING, BY LAYERS AND BY CUTTINGS.

When trees are raised from seeds, as before stated, there is no certainty that the same identical variety will be reproduced. In many cases, the shade of variation will be scarcely perceptible; in others, it will be wide and distinct. It hence becomes desirable in preventing a return towards the original wild state, or, in other words, to perpetuate the identical individual thus highly improved, to adopt some other mode of propagation, for the purpose of multiplying trees of such varieties as possess a high excellence, instead of constantly creating new ones, with the hazard of most of them proving worthless.

It will be distinctly remembered, that new varieties must always spring from seeds; but the same individual variety can be multiplied only by separating the buds, or shoots bearing the buds, of such individual plant. As an example, the Fall Pippin, when first produced from seed, was a single tree of a new variety. The myriads of Fall Pippin trees now existing, are only multiplications of the branches of the original. This multiplication or propagation of varieties is effected in several ways: 1, by Cuttings; 2, Layers; 3, Grafting; 4, Budding. Without these means of propagation, such delicious sorts as the Green Gage plum, the Elton cherry, and the Seckel pear, could never have been tasted except as picked from the single parent tree.

In the multitude of different modes of grafting and budding, success must depend on the observance of certain fundamental principles; a brief recapitulation in part, of some of these laid down in the second chapter, may not be out of place.

During the growing season of a fruit-tree, the sap enters at the fibrous roots, passes up through the alburnum or sap-wood, ascends to the extremities of the branches, and is distributed through the leaves. Emerging thus from the dark and minute vessels of the wood, it is spread out and exposed to the action

of the light. It now becomes essentially changed in character, enters into new combinations, and is charged with the materials for the newly forming wood; it descends, not through the sap-wood, but through the inner or living bark, and deposits a new layer between the bark and the wood. This new layer being soft and fresh, interposed between them, causes that separation known as the *peeling* of the bark.

The sap is capable of flowing sidewise, through lateral openings in the vessels or microscopic tubes. Hence some trees may be cut at one point more than half through on one side, and at another point more than half through on the other side, without intercepting the upward flow of sap, as in Fig. 17. This lateral motion explains the reason why a graft set in the longitudinal cleft of a stock, receives the sap from the split surfaces of the cleft, and succeeds as well as when cross sections of both are brought into contact.

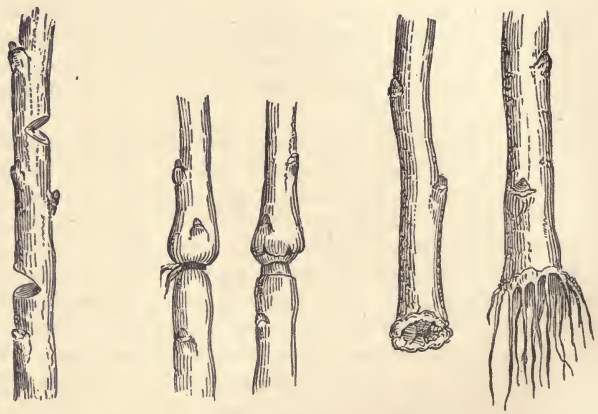

Fig. 17. Fig. 18. Fig. 19. Fig. 20. Fig. 21.

The downward flow of sap, causing swellings, callus, and roots

I. CUTTINGS.

When a ligature is bound closely round a branch, the obstruction which it imposes to the descending juices, causes an enlargement or swollen ring above the ligature, as in Fig. 18. The same result is produced if a small ring of bark is cut out, as in Fig. 19. If a shoot is taken from the tree before the leaves expand, and plunged into moist earth till it commences growth, the descending current exud-

ing from the lower extremity forms a *callus* or ring of the newly formed wood, as in Fig. 20; and under favorable circumstances, the granulations forming the callus emit roots into the soil (Fig. 21), and thus a new plant is formed.

Every leaf-bud on a fruit-tree may be regarded as an embryo branch, and capable of forming a tree when supplied with separate roots. But single buds do not contain within themselves sufficient nutriment to sustain vegetation till roots are formed, without a considerable portion of the alburnum or sap-wood attached; hence the superior advantage of taking an entire shoot or cutting.

Propagation by cuttings is the simplest mode of multiplying a variety. It consists in the insertion of a shoot of one year's growth into the soil; the moisture of the soil renews the supply of sap, the buds swell, the leaves expand, and the descending juices expend themselves in the production of new roots, which shoot downwards into the soil, Fig. 22.

Fig. 22.
Rooted cutting.

Under ordinary circumstances, or in open ground, this mode is only applicable to such species as readily throw out roots, as the currant, gooseberry, quince, and grape. Cuttings of the apple and pear can only be made to strike root in the Northern and Middle States by confining the moisture under glass, while artificial heat is applied.

It may be stated, in general, that cuttings made of the ripened wood of such trees as have a large pith, succeed best when taken off with a portion of the preceding year's wood, such as the gooseberry, currant, vine, fig, etc. With large and strong shoots, the best success will result if cuttings are separated at the point between the one and two years' growth. When small side-shoots are used, they should be cut closely to the main stem, so as to secure the *collar* or enlarged portion of the wood at the base of the shoot, Fig. 23. Roots are more readily thrown out, if the cut is made immediately below a bud.

Fig. 23
Cutting.

The best time to take off cuttings, in ordinary cases, is in autumn and winter. The autumn is preferable, by giving time for the wounded section to cicatrize, preparing it for the early emission of roots in spring. But where the soil is heavy or liable to heave by frost, or where the cuttings are of

tender trees, they should be kept in damp mould in a cellar, to be planted as soon as the frost disappears from the ground. If not taken off till spring, the operation must be performed as early as possible. In ordinary instances, to prevent drying, about two-thirds or three-quarters of the shoot should be buried beneath the surface; and the moisture may be still further retained by a covering of manure, leaves, or moss, or by placing them under the shade of a wall or close fence. When long, like the grape, they should be placed sloping, so as not to be buried too deep or beyond the influence of the sun's warmth. Failure often results from a neglect to press the soil closely about the cutting.

Fig. 24.
Cutting of Currant.

To procure young plants of the gooseberry and currant with straight, clean stems at the surface, and free from suckers, it is only necessary to remove every bud except a few at the upper end, Fig. 24. The length may be from eight inches to a foot.

There are many plants easily propagated by cuttings, if the two great requisites of vegetation, namely, moisture and warmth, are increased by artificial means, as in a hotbed under glass; or in a propagating-house, under sash, or bell-glasses, with fire heat gently applied beneath.

II. LAYERS.

A layer is a low side-shoot bent down and buried at the middle in the soil, Fig. 25. The buried portion strikes root, when it is taken off and planted separately. Its advantage over a cutting is,

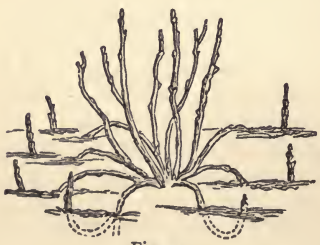

Fig. 25.
Layering.

Fig. 26.
Slitting layers.

that it is nourished by the parent plant while the roots are forming. Hence many plants which cannot be increased by cuttings, and

indeed with great difficulty by budding and grafting, may be propagated readily by layers.

When roots are freely emitted, as from the grape, simply bending the middle of the branch into the soil is enough to insure success. But in cases of difficulty, other expedients are resorted to; one of the most common is to split a portion upwards, immediately under a bud (Fig. 26), which enables the newly forming roots to pass freely and at once into the soil, without the resistance of the thick bark which they otherwise must pierce. Sometimes the branch is cut partly off to intercept the downward passage of the fluids, and induce them to form into roots. At other times a wire ligature, or the removal of a narrow ring of bark, effects the same purpose. Burying the layer several inches under the surface is necessary, to keep it in moist earth; and in drouth, mulching would be beneficial. A small excavation of the soil at the spot is convenient; and when the branch is stiff, it must be fastened down with a forked stick.

The excavation should be made with a spade. Use both hands in bending the shoot, so that it may not be bent too short, and break. If properly done, it will press against the *nearest* side of the hole, rest on the bottom, and rise up, pressing against the opposite side, when it should be fastened *upright*, and if necessary, to a small stake. At the time of bending, a sod or other weight may be laid on to keep it down till the hole is filled; and if the mellow earth be pressed firmly down with the foot, no forked stick will be usually necessary.

The most favorable state of a plant for layering, is when the bark is somewhat soft and not too ripe; and the worst shoots are those which are stunted, and with a hard bark. There are, however, no shoots whatever, not actually diseased, that will not root by layers, if sufficient time be given. Layers, like cuttings, may be made of the ripened wood in autumn or spring; or of the growing wood at or a little before midsummer, when the part intended to root is somewhat mature and firm in texture. The pear, the apple, and the quince, if layered early in the spring; or the grape in summer—will usually be well rooted in autumn.

A moist season is the most favorable to the rooting of layers, by preserving a softer bark. For this reason, many plants may be more easily propagated in England than in the United States; and more readily in Ireland than in England.

Layering is largely made use of for propagating the grape, occasionally for the quince, and sometimes for the apple. It is also of very extensive application in propagating many ornamental trees and shrubs

Suckers may be regarded as spontaneous layers, the new shoots being sent up from buds on the roots or portions of the stem beneath the surface of the ground. They are much employed in multiplying most species of the raspberry. The runners of strawberries may be regarded as layers or suckers above ground.

III. GRAFTING.

Upwards of twenty different modifications of grafting were mentioned by the ancient Roman writer, Varro; and Thouin, of Paris, has described and figured more than a hundred kinds. The great number of modes given in books has tended rather to bewilder than to enlighten beginners; the following remarks, therefore, are more for the purpose of laying down *reasons* on which success depends, than for pointing out the peculiar modes of operation, which may be varied according to convenience, provided attention is given to the essential particulars.

Propagation by grafting differs mainly and essentially from increasing by cuttings, by inserting the cutting into the growing-stock of another tree instead of directly into the soil. The stock thus supplies the sap, as the soil does in the case of a cutting; and the graft, instead of making roots of its own, extends its forming wood downwards, at the inner surface of the bark, into the stock itself. Hence there are two chief requisites for success: the first, that the graft be so set in the stock, that the sap may flow upwards without interruption; and the second, that the forming-wood may extend downwards uninterruptedly through the inner bark. To effect these two requisites, it is needful, *first*, that the operation be performed with a sharp knife, that the vessels and pores may be cut smoothly and evenly, and the two parts be brought into immediate and even contact. *Secondly*, that the operation be so contrived that a permanent and considerable pressure be applied to keep all parts of these cut faces closely together. *Thirdly*, that the line of division between the inner bark and the wood should coincide or exactly correspond in each; for if the inner bark of the one sets wholly on the wood of the other, the upward current through the wood and back through the bark is broken, and the graft cannot flourish or grow. And, *fourthly*, that the wounded parts made by the operation be effectually excluded from the external air, chiefly to retain a due quantity of moisture in the graft, but also to exclude the wet, until, by the growth of the graft, the union is effected.

1. The first requisite is best attained by keeping a keen, flat bladed-knife to cut the faces, and another knife for other purposes.

2. The second requires that the jaws of the stock, in cleft-grafting, press with some force, but not too much, against the wedge-shaped sides of the graft. A stock one-third of an inch in diameter will sometimes do this sufficiently; but three-quarters of an inch is a more convenient size. In whip-grafting, the tongue and slit should be firmly crowded or bound together.

3. The third requisite is attained by close examination with the eye.

4. The fourth is accomplished by plasters of grafting-wax, or by the application of grafting-clay. Grafting-wax may be made by melting together rosin, tallow, and beeswax, in such proportions as to admit of being easily applied when softened by warmth, but not liable to melt and run in the sun's rays. An excellent grafting-wax is made of three parts of rosin, three of beeswax, and two of tallow. A cheaper composition, but more liable to adhere to the hands, is made of four parts of rosin, two of tallow, and one of beeswax. These ingredients, after being melted and mixed together, may be applied in different ways. The wax may be directly applied when just warm enough to run, by means of a brush; or it may be spread thickly with a brush over sheets of muslin, which are afterwards, during a cold day, cut up into plasters of convenient size for applying; or, the wax, after cold, may be worked up with wet hands, and drawn out into thin strips or ribbons, and wrapped closely around the inserted graft. In all cases success is more certain, when the wax is closely pressed so as to fit to every part, and leave no interstices; and it is indispensable that every portion of the wound on the stock and graft be totally excluded from the external air. In cool weather, a lantern, chafing-dish, or hot brick, will be found necessary to soften the plasters before applying them.

The following figures represent the two most common modes of grafting fruit-trees; Figs. 27 to 30, representing successive stages of *whip or tongue grafting*, from the sloping cut of the scion and stock, to the completion of the operation by the covering with the wax-plaster.

Whip-grafting may be employed for large stocks, as shown by the following cut. In order that the line of separation between the bark and wood may coincide in both, the graft must be placed at one side of the large stock, *a*, sloped and tongued for the reception of the graft, *b*, their union being represented by *c*. (Fig. 31.) To facilitate the wrapping of the wax plasters, one side and the upper point of the stock are pared off with a knife, before the two are joined, as shown by the dotted line. This is a good mode of grafting any

stocks not over three-fourths of an inch in diameter, in the nursery row.

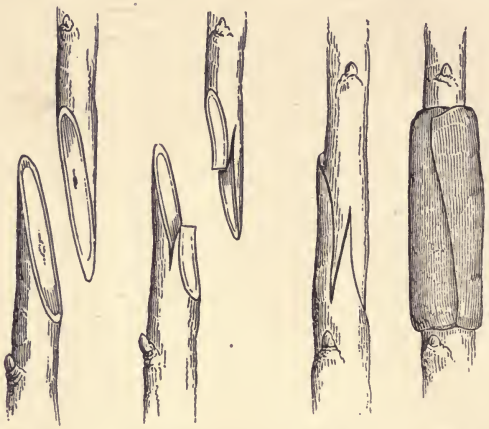

Fig. 27. Fig. 28. Fig. 29. Fig. 30.

Whip-grafting.

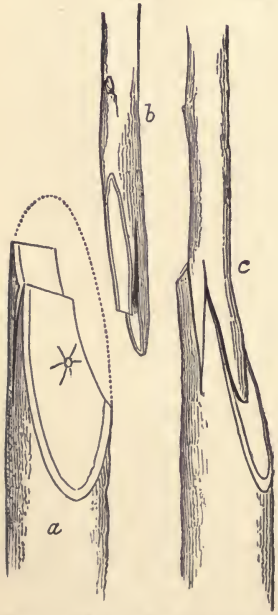

Fig. 31. *Whip-grafting large stocks.*

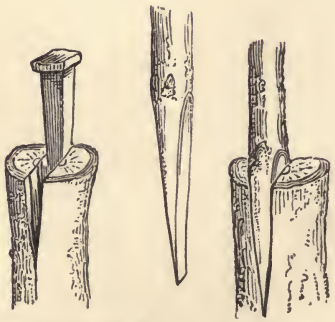

Fig. 32. Fig. 33. Fig. 34.

Cleft-grafting.

Fig. 32 shows a stock cut off for cleft-grafting, with the upright cleft separated by an iron or steel wedge, ready for the graft; Fig. 33, the graft cut wedge-form to fit it; and Fig. 34, the graft in its place after the wedge has been withdrawn, the projecting angle

of the stock sloped off with a knife, and the whole ready for the application of the wax.

Whip-grafting is particularly applicable to small stocks, or where the graft and stock are nearly of equal size; and cleft-grafting to stocks considerably larger than the scion. In all cases, where the stock is in any degree larger, the graft must be placed towards one side, so that the line between the bark and wood may exactly coincide at one point at least in both, as in the cross-section of cleft-grafting, Fig. 35. A useful implement for the rapid and perfect performance of cleft-grafting, is described in the chapter on implements.

Fig. 35.
Section of cleft-grafting.

There are other modifications of grafting which are often useful. In *saddle-grafting*, the stock is sloped off on each side, giving it the form of a wedge, Fig. 36, *a*; the graft is split in the middle, and each side thinned away with the knife, as in Fig. 36, *b*, until it will closely fit when placed like a saddle upon it, Fig. 37. The most perfect way to fit the graft, is to make a long sloping cut from the outer edge or bark, by drawing the blade from heel to point, till it reaches the centre of the graft; and then another similar cut completes the acute cavity for fitting the wedge of the stock. A sharp, broad, and thin blade is needed for this operation. A wax plaster, drawn closely round the place of union, completes the work. When the stock and graft are very nearly of equal size, this is a very perfect mode of grafting, as large corresponding surfaces are made to fit, and the graft receives freely the ascending sap.

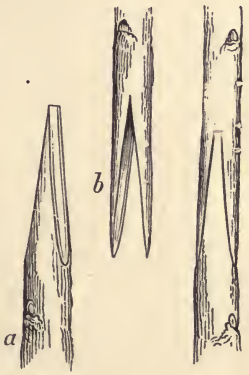

Fig. 36. Fig. 37.
Saddle-grafting.

In all these modes of grafting, whenever a wedge is made to enter a cleft, it should be thickest on the side where the fit is made between the two parts, so as to receive the full pressure of the cut faces at that side, as shown in Fig. 35.

A modification of saddle-grafting, very successful in its results, is thus performed:—Late in spring, after growth has commenced, the scion, which is much smaller than the stock, is split up, nearer to one side, more than half its length (Fig. 38). The stronger side is then

sharpened into a wedge at its point, and introduced between the bark and the wood, a slight longitudinal slit being made through the bark of the stock, that it may open slightly and admit the graft. The thinner division of the graft is fitted to the opposite sloping side of the stock. The whole is then covered with wax. The great length of that portion of the graft in contact with the bark and fresh wood, greatly facilitates their union; while the cut face of the stock is speedily covered with a new growth by that part of the graft which rests upon it.

Fig. 38. *Saddle-grafting.*

In grafting the peach, which, from its large pith and spongy wood, scarcely ever succeeds as commonly performed, it is found advantageous, in selecting the grafts, to leave a quarter of an inch of the more compact two years' wood at the lower extremity.

In grafting the plum and cherry, success is found to be much more certain when the work is performed very early in spring, before the buds commence swelling, or even before the snow has disappeared from the ground. Apples and pears may be grafted later, and if the scions have been kept in good condition in a dormant state, they will mostly grow if inserted even after the trees are in leaf.

After a graft is inserted, and as soon as the tree commences growth, the buds on the stock must be rubbed off, in order to throw the rising sap into the scion. If large trees are grafted, the buds need only rubbing off the branch which holds it.

Where it becomes desirable to preserve rare sorts, which have been grafted late in spring, a loose wrapper of white paper round the graft will protect it from the drying and scorching rays of the sun; or shrivelling and failure will often be prevented by covering the whole graft with a wax-plaster; or by encasing it in moss kept damp by occasional applications of water.

Root-grafting is performed by taking up the stocks by the roots, and inserting the grafts immediately into the part below ground after the tops are cut off, when they are again planted out, with the tip of the graft only above ground. This mode is successful with the apple, and occasionally with other trees, and is adopted on a large scale by nurserymen, the work being performed in winter or early spring within doors, and the grafted roots kept in cellars till the ground is ready to receive them. A full description of the mode is given in the chapter on the apple.

Cutting Grafts. Grafts are usually cut during the latter part of

winter or early in spring; but if well kept they may be taken from the tree at any time between the cessation of growth in late summer or autumn, and the commencement of vegetation in spring. They may be preserved out-of-doors safely, if buried in moderately moist earth, by placing them in a box open downwards, and buried on a dry spot, the scions being kept from contact with the earth by sticks across the box. They may be conveniently preserved in a cellar in a box of damp powdered moss; or in moderately moist peat or black muck. Sawdust answers the same purpose, if not in large quantities so as to become heated. In cutting, the name may be kept temporarily by writing with a common lead-pencil on a shaved portion of the shoot (Fig. 39); but for packing away permanently, write the name on both sides of a strip of shingle, say a foot long and half an inch wide (Fig. 40), and tie this up with the scions, the outside writing readily showing the name, and the inner to refer to in case the outside is erased (Fig. 41). Scions not fully hardy, as of most sorts of plums, should be cut early in winter, or before they have been exposed and injured by severe cold.

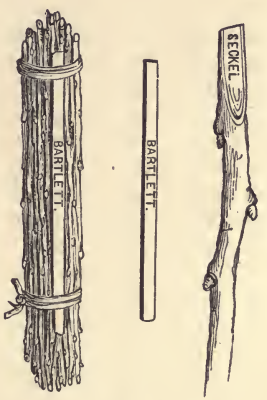

Fig. 41. Fig. 40. Fig. 39.
Marking and packing grafts.

In order to send scions by mail, they are best put up by enclosing them in cases of oil-silk (such as is used for hat-lining), by wrapping the oil-silk about the scions and over the ends, and then passing a fine thread repeatedly round from end to end, making the whole air-tight (Fig. 42). The natural moisture is thus preserved, and they cannot shrivel. The names should be written with pencil on the ends, and no paper for this purpose wrapped around them, as it absorbs the moisture. Grafts have been shrivelled and spoiled by mistakenly placing dry cotton batting among them before being thus encased. To send grafts in larger quantities, or by "express," pack them in alternating layers of fine, slightly-damp moss. It is always important, whether packing grafts for keeping or for distant conveyance, to preserve the

Fig. 42.
Grafts packed for sending by mail.

natural moisture precisely, and no more. If the packing is too wet, they will become water-soaked and rot.

Grafts which have become dry, may be restored if the moisture is applied so gradually that its absorption may require several weeks. by burying them as above stated.

SAVING MICE-GNAWED TREES.—A MODIFICATION OF GRAFTING.

Young orchards which are kept perfectly clean by cultivation, are seldom injured by mice under snow. There are some instances, however, where mice will attack those which stand near the boundary fences or in proximity to grass ; and sometimes a hard crust of ice or snow may be formed on the surface, over which mice will travel beneath a second fall of snow, in committing their depredations. Many young orchards are more or less encumbered with grass and weeds, and the trees are often found girdled in spring. A preventive that rarely fails, that of embanking small mounds of smooth earth round the trees in autumn, is not often adopted, and hence we have frequent inquiries, "What shall we do to save our mice-gnawed trees ?"

Fig. 43 represents the stem of a young tree entirely girdled near the surface of the ground. The tree will, of course, perish unless a connection is made between the two portions of bark.

An easy way to repair this damage is represented in Fig. 44. It consists merely in fitting into openings made with a half-inch chisel, short pieces of round wood sharpened at both ends to fit the chisel-

Fig. 43.

Fig. 44.

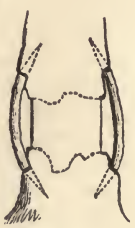

Fig. 44 *a*.

cuts. These cuts are made by placing the chisel, when making the lower cuts, nearly upright or slightly inclining outwards from the

tree, and then placing the point upwards in a corresponding direction when making the upper cuts. The sharpened pieces or shoots are then bent outwards in the middle until the points will enter the openings, when they are firmly crowded in with the hand until brought nearly straight, as shown in the figure. Fig. 44 *a* exhibits a section of the tree and the exact position of these pieces when inserted. Where a large number of trees are injured, four or five pieces to each tree are enough. They will rapidly enlarge as the tree grows, and in a few years become confluent. If a few choice trees have been girdled, a larger number may be inserted, so that they may be nearly in contact—thus securing a complete cure in a year or two. The work may be covered with grafting-wax or with a small mound of earth—perhaps the operation would be successful without any covering. It is not necessary that it be performed very early in spring—it will even answer after the buds have begun to swell.

IV. BUDDING.

Budding consists in introducing the bud of one tree, with a portion of bark and a little adhering wood, beneath the bark of another, and upon the face of the newly forming wood. It must be performed while the stock is in a state of vigorous growth. An incision is made lengthwise through the bark of the stock, and a small cut at right angles at the top, the whole somewhat resembling the letter T, Fig. 45. A bud is then taken from a shoot of the present year's growth, by shaving off the bark an inch or an inch and a half in length, with a small part of the wood directly beneath the bud. Fig. 46.* The edges of the bark, at the incision in the stock, are then raised a little, Fig. 47, and the bud pushed downwards under the bark, Fig. 48. A bandage of bass, corn-husk, or other substance, is wrapped round, covering all parts but the bud. The pressure should be just sufficient to keep the inserted portion closely to the stock, but not such as to bruise or crush the bark, Fig. 49.

The shoots containing the buds should be cut when so mature as to be rather firm and hard in texture; they are usually in the best condition after the terminal bud has formed. To prevent withering, the leaves must be immediately cut off, as they withdraw and exhale rapidly the moisture from the shoot; about one-quarter of an inch

* It is not a common practice in this country to take the thin shield of wood out of the bud, but it is sometimes done advantageously when this portion of wood is too old or hard to fit the stock readily.

of the footstalks of the leaves should remain, to serve as handles to the buds while inserting them, Fig. 50. After being thus di-

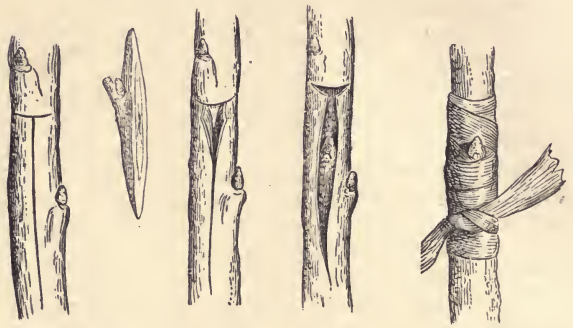

Fig. 45. Fig. 46. Fig. 47. Fig. 48. Fig. 49.

Successive stages of budding.

vested of leaves, they may be safely kept a week in a cool, damp place, or sent hundreds of miles in damp moss, or encased separately in thin oil-cloth.

Fig. 50.
Stick with buds.

Fig. 51.
Tying the young shoot.

When, by growth of the stock, the bandage cuts into it, usually in ten days or more, it must be removed. The bud remains dormant till the following spring, when the stock is cut off two inches or more above it, before the swelling of the bud. If cut closer, the end of the stock becomes too dry, and the bud often perishes. All other buds must be then removed, and all the vigor of the stock or branch thrown into the remaining bud, which immediately commences a rapid growth.

To secure a straight and erect tree, the new shoot, when a few inches long, is tied to the remaining stump of the stock, Fig. 51. By another month, no further

support will be needed, and the stump may be wholly cut away, and the wound allowed to heal by the rapid formation of new wood.

Buds inserted by midsummer, may be made to grow the same season by heading down the stock when adhesion has taken place; but although often attempted, no advantage has resulted from this practice, as the growth is comparatively feeble, and in consequence of its badly matured wood often perishes the following winter. Even where it escapes it does not exceed in size at the close of the second season the straight and vigorous shoots of the spring.

The essential requisites for success in budding are, *first*, a thrifty, rapidly growing stock, so that the bark will peel very freely. *Secondly*, a proper time; not so early that there will be too little cambium or mucilaginous cement between the bark and the wood, for the adhesion of the bud; nor so late that the bark will not peel, nor the subsequent growth sufficiently cement the bud to the stock. *Thirdly*, buds sufficiently mature. *Fourthly*, a keen flat knife, for shaving off the bud, that it may lie close in contact upon the wood of the stock. *Fifthly*, the application of a ligature with moderate pressure, causing the bud to fit the stock closely.

When stocks are in the best condition, it is unnecessary to raise the bark any further than to admit the lower point of the bud, which, as it is pushed downwards, performs this operation in the most perfect manner. When the bark does not peel freely enough for this purpose, success becomes uncertain.

Budding is performed in summer, grafting in spring, and both have their advantages. Budding is a simpler operation, and more successfully performed by a novice. It is the best means to multiply the peach and nectarine, grafting rarely proving successful at the North. It is more rapidly performed, and at a season not crowded with the labors of transplanting. It admits a repetition the same summer, in cases of failure, the stocks remaining uninjured. But in all cases thrifty stocks are needed, while grafting will succeed on those older and less vigorous. Grafting requires less care subsequently, as no ligatures need removing, nor stocks heading down, and may be conveniently employed as a remedy for failures in the previous summer's budding.

Terminal Budding. It sometimes happens, where buds are scarce, that the terminal bud on the shoot may be used to advantage. In this case, the wood is cut sloping downwards, and the insertion is made as usual, Fig. 52, except that it becomes necessary to apply the whole of the ligature below the bud. The buds on small side-shoots which are not more than an inch or two long,

may be successfully used in this way, as the terminal eyes are stronger than any of the others. This practice may sometimes be adopted with advantage with the peach, where scions of feeble growth only can be obtained, as terminal buds usually escape the severity of winter when most of the others are destroyed.

Fig. 52.
Terminal budding.

Spring budding is successfully practised as soon as trees are in leaf, the buds having been kept dormant in an ice-house or cool cellar. As soon as they have adhered, the stock is headed down, and a good growth is made the same season. The peach, the nectarine, the apricot, and the mulberry, all difficult to propagate by grafting, may in this way be easily increased by budding. If the buds are kept in a cellar, it will be found important to preserve with them as uniform a degree of moisture as possible, and in as small a degree as will keep them from wilting.

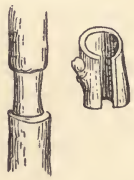

Fig. 53.
Annular budding.

Annular Budding is applicable to trees of hard wood, or thick or rigid bark, as the walnut and magnolia. A ring of bark is removed from the stock; and another corresponding ring, containing the bud, slit open on one side, is made to fit the denuded space (Fig. 53).

LIMITS OF BUDDING AND GRAFTING.

In former ages of the world, it was erroneously supposed that grafting could be performed between every species of tree and shrub. "Some apples," says Pliny, "are so red that they resemble blood, which is caused by their being at first grafted upon a mulberry stock." Roses, it was said, became black when grafted on black currants, and oranges crimson if worked on the pomegranate. But the operation is never successful unless the graft and stock are nearly allied, and the greater the affinity the more certain the success. "Varieties of the same species unite most freely, then species of the same genus, then genera of the same natural order; beyond which the power does not extend. For instance, pears work freely upon pears, very well on quinces, less successfully on apples or

thorns, and not at all upon plums or cherries; while the lilac will take on the ash, and the olive on the Phillyrea, because they are plants of the same natural order." *

There are, however, some exceptions to this rule. Thus, the cultivated cherry, and most species of wild cherry, though of the same genus, will not agree. The pear succeeds better on the quince than on the apple, although the apple and pear are within the same genus, and the pear and quince are by most regarded as of distinct genera; the superior firmness of the wood of the quince, a quality so important to successful grafting, more than compensates the difference in affinity.

Lindley mentions also some exceptions which are apparent only. In one case, the fig was supposed to grow on the olive. But the graft, being below the surface of the soil, rooted independently of the fig-stock. "I have seen," says Pliny, "near Thulia, in the country of the Tiburtines, a tree grafted and laden with all manner of fruits, one bough bearing nuts, another berries; here hung grapes, there figs; in one part you might see pears, in another pomegranates; and to conclude, there is no kind of apple or other fruit but there was to be found; but this tree did not live long." This is explained by the process now sometimes performed in Italy, for growing jasmines and other flexible plants on an orange-stock, by the ingenious trick of boring out the orange stem, through which the stems of the other plants are made to pass, and which soon grow so as to fill it closely, and to appear as if growing together. Such a crowded mass of stems must, of course, soon perish.

* Lindley, Theory Hort.

CHAPTER V.

SOIL, MANURES, SITUATION, AND ENCLOSURES.

THE soil for fruit-trees, as well as for farm crops, should be of good quality. Whatever will produce a vigorous growth of corn and potatoes, will in general be the best for fruit-trees. Sterile soil is unfavorable for both; but doubly so for the latter; for while it only lessens in *quantity* the growth of farm crops, it lessens the quantity and greatly injures the *quality* of fruit.

Good soils vary in many particulars; but as a general rule, one which is dry, firm, mellow, and fertile, is well suited to this purpose. It should be deep, to allow the extension of the roots; dry, or else well drained, to prevent injury from stagnant water below the surface; firm, and not peaty or spongy, to preclude injury or destruction from frost.

Few soils exist in this country which would not be much benefited, for all decidedly hardy fruits, as the apple and pear, by enriching. Shallow soils should be loosened deeply by heavy furrows; or if the whole surface cannot be thus treated, a strip of ground eight feet wide, where the row of trees is to stand, should be rendered in this way deep and fertile for their growth. Manure, if applied, should be thoroughly intermixed with the soil by repeated harrowings. An admirable method of deepening soils for the free admission of the fine fibrous roots, is first, to loosen it as deeply as practicable with the subsoil-plough; and then to trench-plough this deeply loosened bed for the intermixture of manure. The previous subsoiling admits the trench-plough to a greater depth than could be attained without its aid. The only trees which will not bear a high fertility, are those brought originally from warmer countries, and liable to suffer from the frost of winter, as the peach, nectarine, and apricot; for they are stimulated to grow too late in the season, and frost strikes them when the wood is immature. It however happens, in the ordinary practice of the country, that where one peach or apri-

cot-tree is injured by too rich a cultivation, more than a hundred suffer by diminished growth from neglect.

Clayey and light soils in some cases require opposite management. The former, for instance, is much benefited by the admixture of chip-dirt, which renders it looser, lighter, and more retentive of moisture. But on light soils the effect is not so beneficial, and is sometimes positively injurious.

Peaty and spongy soils are particularly unfitted for tender fruits. They become very warm by day, and radiate the heat rapidly in clear frosty nights; hence, peaches and apricots generally perish when growing on them, the heat of the sun promoting a rapid succulent growth, which is the more easily destroyed by the succeeding intensity of cold.

MANURES.

Nothing for general use is equal to stable manure, and in ordinary cases it will be found to give the most uniform and satisfactory results—more especially if it is made the basis of a compost with peat, muck, or turf from old pastures, with a tenth or a fifteenth of leached ashes, and half that of bone-dust. If these are thoroughly mixed with the soil down to a depth of a foot or more, by subsoiling, trench-ploughing, and cross-ploughing, in connexion with repeated harrowings, fine trees and excellent fruit may be confidently expected even on soils of naturally moderate fertility. Many parts

Fig. 54.—*Draining orchards.*

of the Western States possess a soil quite rich enough, provided good cultivation is given. A *well drained* subsoil is of course all-important, for all manure is nearly lost on land kept soaked with

water. Even old bearing trees have been much improved by laying tile two and a half or three feet below the surface, midway between the rows (Fig. 54). The young forming-roots being the most remote from the tree, receive the greatest benefit from drains thus placed, and the tile is less liable to be thrown out of position by large roots or filled by smaller ones.

SITUATION.

After a suitable soil is obtained, hardy trees, such as the apple, will usually succeed in almost any situation. But with tender fruits, as the peach and apricot, the case is very different. In many localities in the Northern States, they are soon destroyed by the severity of winters, and their cultivation is accordingly not attempted. In others, crops are not yielded oftener than once in two years. But some situations are so favorable, that a failure scarcely ever occurs. In planting out tender fruits, it is consequently desirable to know what places will prove the best. Even the apple, in regions where the winters are rigorous, is sometimes destroyed by frost, and in very unfavorable places rarely escapes.

It is familiar to many cultivators, that warm, low valleys are more subject to night-frosts than more elevated localities. Objects at the surface of the earth are chilled by the radiation of heat to the cold and clear sky above, and they cool by contact the surrounding air, which thus becoming heavier, rolls down the sides of declivities and settles like the waters of a lake, in the lowest troughs. This coldness is further increased by the stillness of those sheltered places favoring the more rapid cooling, by radiation of the exposed surfaces; while on hills the equilibrium is partially restored by currents of wind. Superadded to these causes, vegetation in low, rich, and sheltered places is more luxuriant, and wood less ripened, and hence particularly liable to injury from frost. The mucky soil of valleys radiates heat rapidly from its surface. The warmth of low places, during the mild weather, occurring in winter, often swells fruit-buds, and succeeding cold destroys them. On more elevated lands, vegetation escapes all these disastrous influences.

The existence of colder air in valleys, on still, clear nights, is often plainly observed in riding over a rolling or broken face of country. The thermometer has shown a difference of several degrees between a creek bottom and a neighboring hill not fifty feet high. A striking proof was exhibited a few years since, after a severe night-frost early in summer. The young and succulent leaves of the hickory were

but partially expanded; and where the trees stood in a valley, twenty feet deep, all the leaves had been frosted, and were black and dead, up to the level of the banks on each side, while all above the surface of this lake of cold air were fresh and green.

During the cold of a clear winter night some years ago, which sank the thermometer several degrees below zero, after the peach-buds had been swelled by a few warm days, trees which stood on a hill thirty feet higher than the neighboring creek valley, lost nine-tenths of their blossoms; while on another hill sixty feet high, nine-tenths escaped. The lake of cold air which covered the top of the smaller hill did not reach the summit of the larger.

The cultivation of the peach is rarely attempted in the southern tier of counties in the State of New York. Proofs are not wanting, however, that it might be entirely successful on selected ground. A number of instances have been observed where peach orchards, planted on the dry lands of the hills in different parts of this region, have flourished and bore regularly; at the same time that orchards in the warm valleys below rarely yielded crops, and the trees themselves were sometimes destroyed.

These cases show the importance of elevated sites. A dry, firm soil is, however, of great consequence. The influence of a compact knoll, rising but slightly above the rest of the field, has been observed to save from frost the corn which grew upon it; while on the more mucky or spongy portions of the rest of the field, radiating heat more freely, the crop has been destroyed. Cultivators of drained swamps have found it necessary to plant such lands with tender crops two or three weeks later in spring than the usual period on upland. The successful cultivation of the peach and the grape, on the gently swelling hills called *mounds*, in the western prairies, while the crops are destroyed on the adjacent dark and porous soils of the plains, affords another example. Sometimes the effect of unfavorable soil more than over-balances that of situation. In some of the hilly parts of western New York, where the highest land is peaty, spongy, or springy, and the valleys dry and firm, the latter are found best for the peach.

The preceding facts furnish strong reasons for believing that, in large portions of the Northern States, where the cultivation of the peach has been entirely relinquished in consequence of the only attempts having been made in the warm valleys, abundant crops might be regularly obtained by a proper selection of soil and locality. Even much further south, the occasional destruction of tender fruits points out the great importance of careful attention to situation.

Influence of deep Lakes and Rivers. Large bodies of unfreezing water in the bottoms of valleys will reverse some of the preceding rules, and the banks of such waters are peculiarly adapted to the cultivation of tender fruits. They soften the severity of the cold, by the large and warmer surface constantly presented; on the other hand, they chill the dangerous warm air which starts the buds in winter, and they afford great protection by the screen of fog which they spread before the morning sun. Along the borders of the lower parts of the Hudson, and on the banks of the Cayuga and Seneca lakes, tender fruit-trees often afford abundant crops, while the same kinds are destroyed only two or three miles distant. Along the southern shore of Lake Ontario, the peach crop scarcely ever fails, and the softening influence of that large body of unfreezing water extends many miles into the interior. The same result is observed in northern Ohio, bordering on Lake Erie; and in western Michigan, adjoining the great lake of that name.

Fruit-buds, as well as tender trees, are occasionally destroyed by thawing by the morning rays, after a cold night. The protection from these rays afforded by an eastern hill, buildings, or other screen, has led to the erroneous conclusion that the destruction alluded to was caused by the *east wind.*

It has frequently been observed that when the lower branches of a peach-tree have been buried in a snow-drift, the crop thus covered was saved. This has suggested the successful practice of training peach-trees low, and covering the branches in winter with masses of evergreen boughs. The rigidity of the stems prevents their bending down; but as the roots are more flexible, laying down has succeeded by digging under on one side, the trees having been previously trained flat for this purpose.

In localities exposed to the sweep of winter winds, belts of evergreen or deciduous trees will be found of great service. In all instances where the side of an orchard, exposed to prevailing winds, is less successful and productive than the opposite side, proof is afforded that shelter would be beneficial; belts, especially if of deciduous trees, standing too near fruit-trees have, however, rather injured than benefited them. The orchards should be beyond the reach of their shade and roots, and be well exposed to sun and air.

ENCLOSURES.

The skilful cultivator, after having prepared his ground, procured the best trees the country affords, carefully transplanted them, and given them watchful and laborious attention for years, feels a very natural desire to partake of their fruits. But this he cannot do, in many places, unless his fruit-garden is protected from the rambles of idle boys. It cannot be denied that our country is rather remarkable for its fruit-pilferers. It is feared it will continue to be so, until public opinion shall place the young man who steals a pocket-book, and the depredator of fine fruit, which has cost the owner as much care and labor, and which money cannot replace, on precisely the same level.

This formidable evil has deterred many from planting fruit-gardens. The most quiet and secure protection is afforded by a good thorn hedge. The English hawthorn, far to the north, will generally succeed quite well for this purpose. The buckthorn is extremely hardy, has a thick dense growth, and is easily raised and transplanted; but, except on very rich soils and with good cultivation, it does not form a stout barrier. The Honey Locust is also very hardy, but requires more care in cutting back and thickening; it may, however, be made into an excellent hedge for a fruit-garden if the most thorny plants are selected. The Osage Orange, where the winters are not too severe, is best of all. It is densely armed with sharp thorns, and becomes impassable. It is only hardy on dry ground, or near the line of an underdrain.

Two reasons have operated in preventing a more general and successful adoption of hedges. One is the aversion so prevalent to undertake anything which does not produce immediate results, several years being required to make a perfect hedge. The other is the almost universal notion, adopted without a moment's thought, that everything in the form of a tree must grow and take care of itself. Hence we see, for every good well managed hedge, at least one hundred bad and neglected ones. This remark applies with more force to the attempts made with the Osage Orange than with any other plant; for nothing that is ever used for hedges is more sensitive under bad usage, or succeeds better if well treated, than this. The privet and the buckthorn will usually present something of a hedgy appearance with any kind of management; but the Osage, unless well cultivated and properly sheared, will not exhibit

even the semblance of a hedge. Hence, the common notion that it has proved a failure.

Evergreen hedges are mostly employed as screens from observation and from winds; but as intruders scarcely ever attempt to pass where they cannot look through, perhaps they may yet be used as efficient barriers. The American Arbor-Vitæ is well adapted for this purpose, but like the buckthorn, it will not grow well in the shade; hence, when closely sheared, the interior branches are bare. Instead, therefore, of being sheared in the common way, it should be short-

Fig. 55. Fig. 56. Fig. 57.

Trimming hedges.

ened back. The close growth of a smoothly shorn surface, darkens and kills the interior foliage, as shown in Fig. 55. Fig. 56 represents the same shortened back, or rather *thinned back*, admitting the light within. Fig. 57 shows how this is done, the cut being made at a fork *b*, or still shorter at *a*.

The *hemlock*, although hardly stout enough for a hedge until it has grown many years, forms one of the most perfect and beautiful screens in existence, and it would prove a fine shelter for trees against the wind. Its fresh, deep, green color is unsurpassed; and its denseness of growth in consequence of its quality of growing in the shade, is scarcely equalled. The Norway spruce will probably prove a fine hedge-tree. It grows with great vigor, and may be freely shortened back.

The Osage Orange grows rapidly if well cultivated; and in order to insure a perfectly continuous and even hedge, the young plants must be allowed to swell their buds before they are set out, that all dead and feeble plants may be rejected. The first winter a light furrow should be ploughed upon it, to protect and drain it at the same operation. The soil should be kept deep and mellow by cultivation, at least four or five feet on each side, instead of allowing it to grow up with weeds and grass, as is usual; and, if possible, it should be

placed nearly over a tile drain, which will contribute greatly to its endurance of winter.

The following figures (some of which are reduced from those in

Fig. 58.—*Badly pruned hedge.*

Fig. 59.

Fig. 60.

Warder on Hedges), will show how this, and indeed all hedges, should be sheared.

The neglect of cutting down at the commencement, causes the hedge to become thin and narrow, and full of gaps at the bottom where it should be the thickest; and dense and impenetrable only at the top, where this is less essential. In other words, the hedge becoming wrong-side-up, or mounted on stilts (Figs. 58 and 59).

Fig. 61.

Fig. 62.—*First year, newly set out.*

Fig. 63.—*Beginning of second year.*

The appearance of the young hedge just before cutting down the first time is shown at *a*, Fig. 60, and the cut portion at *b*. It is almost impossible to induce a novice to cut "this fine growth;" he

thinks it will "ruin" his young and promising fence. Yet if the work is omitted, it will in a few years appear as in Fig. 61.

The following is the regular order of working each successive year. Fig. 62 represents the plant the first year, or a few weeks after setting out; it has been cut down nearly to the surface of the earth, the tap-root trimmed off, and the young shoots as starting from it at *a*. It should grow untouched at least one year—some prefer two years, in order that the roots may become thoroughly established. Its appearance the beginning of the second year is shown in Fig. 63, when it is cut down again near the line, *b*, to

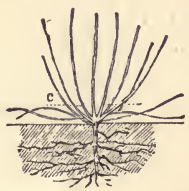

Fig. 64.—*Beginning of third year.*

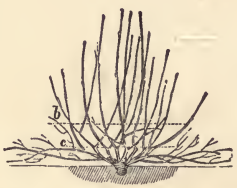

Fig. 65.—*Summer of third year.*

thicken it at the bottom. The result of this cutting down is shown in Fig. 64, which is the same plant after further growth, and which is again to be cut down at the line *c*; this may be done in the spring of the third year, if the hedge has been well managed and kept vigorous. This shearing will not be more than four or five inches high. Nervous people "cannot bear" thus to cut down their beautiful growing hedges—and of course never have a good one. But if the work has been unflinchingly done, the hedge will present by early summer of the third year, the fine broad-based, thickened appearance at the bottom, represented by Fig. 65. The next pruning, to be done at the beginning of the fourth year, is shown in Fig. 66, as indicated by lines meeting at *e*, when the hedge for the first time begins to assume the form of a roof. The previous shearings (or rather mowings) are shown by the dotted lines *c* and *d*. Fig. 67 shows the subsequent cuttings—first by the lines meeting at

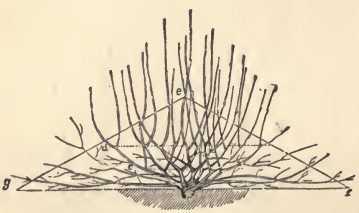

Fig. 66.—*Beginning of fourth year.*

h, and afterwards at *o*. The latter may be straight, as the previous ones, or in the form of a gothic arch, as shown by the figure. This brings the hedge to the close of the fourth year, when it will begin to form an efficient barrier, if it has been well cultivated and pruned. Its breadth at bottom will be nearly double its height. Future years will give it more height; but it must be especially observed to keep it always narrow at top, so that the foliage above shall not shade that below, nor injure the broad thick growth at bottom.

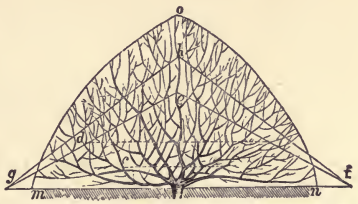

Fig. 67.—*End of fourth year or beginning of fifth.*

Hook to Trim Hedges. With a common corn-knife, like that shown in Fig. 68, one man has trimmed from half to three-quarters

Fig. 68.

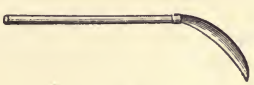
Fig. 69.

of a mile of four years' hedge on both sides in a day—striking upwards and cutting it to a peak in the middle, like the roof of a house. Subsequently, with a longer handle and straighter blade, as in Fig. 69, he was enabled to work more easily and rapidly. As the hedge becomes older, the labor will probably be somewhat increased.

CHAPTER VI.

TRANSPLANTING.

ORCHARDS are usually set out, where the soil is good, with no other preparation than good ploughing. But where the soil possesses only moderate fertility, if the best growth and finest fruit is desired, it must receive additional preparation. When marketing and profit is the chief object, this preparation is of great importance, as the finest fruit often brings double the price obtained for that of common quality. The following directions are therefore worthy of attention.

Preparing the Ground and Manuring. Ground intended for trees must be secure from danger of being flooded in wet seasons, and from all liability of becoming water-soaked beneath the surface. If not naturally dry enough, it must be thoroughly underdrained.

The next requisite is to deepen and enrich the soil by *trenching*, unless naturally or previously exactly fitted for trees. The same result may be attained by digging very large holes, say eight feet in diameter, and a foot and a half deep, and filling them with rich earth. But a better way is to plough the whole surface to nearly that depth, and to enrich it well by manuring. A common plough will descend six or seven inches; by passing another plough in the furrow—that is, by trench-plowing—the soil may be loosened to ten inches or a foot. But by means of a good subsoil-plough in the common furrow, a depth of fifteen to eighteen inches may be reached. Now, to work the manure down to that depth, and make the whole one broad deep bed of rich soil, it must be first spread on the surface evenly after the whole has been well subsoiled, then harrowed to break it fine and mix it with the top soil, and then thrown down by a thorough trench-ploughing. For although the trench-ploughing can hardly be worked a foot in depth of itself, yet after a good loosening with the subsoil-plough, it may be at once extended down a foot and a half. If this is done in the fall, and another good ploughing given in spring, the whole will be in fine condition for the reception of trees. Does

this seem like a great deal of cost and labor? It is the very cheapest way of obtaining fine crops of the best fruit; for the strong, long, and healthy shoots which will run up even the first year, and the size, beauty, and richness of the fruit soon afforded from such an orchard, kept well cultivated during its early years, will astonish those who have never seen any but slip-shod culture.

In setting out large orchards, if the whole field cannot be deepened, a strip of land ten feet wide extending across the orchard, may be treated in the same way, in the centre of which each row is to be set; and the intermediate spaces, constituting two-thirds or more of the whole, may, if necessary, be prepared afterwards, by the time the roots have passed the boundaries of the first.

LAYING OUT ORCHARDS.

Every one will admit that an orchard handsomely laid out in perfectly straight rows, is in every respect better than where the trees are in crooked lines. An owner can feel no pride in giving proper cultivation to an awkwardly planted orchard; and trees standing out of line will be a constant annoyance to every ploughman who is in the practice of laying perfectly even furrows.

Some planters take great pains in setting their trees, so that one tree at the end of the row will hide all the rest when the eye ranges through the line. But in securing this desirable object, a great deal of labor is often expended in sighting in different directions while setting each successive tree, so that every row may be straight every way. The following mode of laying out and planting will not require one-twentieth of the labor commonly devoted, may be performed under the direction of any common workman, and will give rows that will range perfectly, not only in both directions, but diagonally. The writer has found that two men would thus lay out from thirty to forty acres in a day, with perfect precision for planting.

The first thing to do is to procure as many short pins or stakes, a few inches long, as there are to be trees in the orchard. These may be made by simply splitting short blocks or boards with an axe, say half an inch in diameter; or corn-cobs will answer a good purpose, and may be more easily seen. Then procure a strong cord as long as one side of the orchard, or, if the orchard is very large, as long as each section may be, if necessary to divide it. Then, with a pole or other measure, mark off the distances of the trees on this line, sticking a common brass pin through at each place for a tree, bending it around the cord so that it will not come out. Red yarn

sewed through and tied around the cord would be more visible than pins; but the latter are quickly found if the workman measures the distance by pacing between them as he walks from one to the other A new cord will stretch a little at first, but will soon cease to do so. The easiest way to mark the spaces on the cord is to wrap it around the ends of a board cut at the right length, so that every third coil shall be a place for the pin. Thus, if the board is five feet long, by marking every third coil at the end of the board we obtain spaces of thirty feet. The field having been ploughed and fitted for planting, we are now ready for operation. Select a still day, so that the wind will not blow the cord out of place, and then stretch the line along one side of the field, at a suitable distance from the fence where the first row is to be. Make it as straight as possible, by drawing on it forcibly; a stout cord being better than a weak one on this account. If the land be tolerably level, twenty or thirty rods may be measured off at a time. Place flat stones or other heavy weights upon it at intervals, to keep it in position; if there is some wind, care will be necessary in making it perfectly straight before thus fixing it. Next, drive in one of the short pegs or sticks at each point marked by the pin already described. When this is done, one row will be marked. Then remove the line, and mark each end of the field at right angles to this in the same way. Lastly, mark the remaining side. Before marking both ends, it is safest to stretch the line on the fourth side, that all may be accurately spaced. Next, to fill up this hollow square with the proper marks, stretch the line successively between corresponding sticks on the opposite sides, and mark as before till the whole is completed. If the work has been carefully done, every stake will be found to range perfectly. Every cord will stretch more or less, but if stretched so that the ends will come out even each time, which is attended with no difficulty, the rows will be perfect, as shown in Fig. 70.

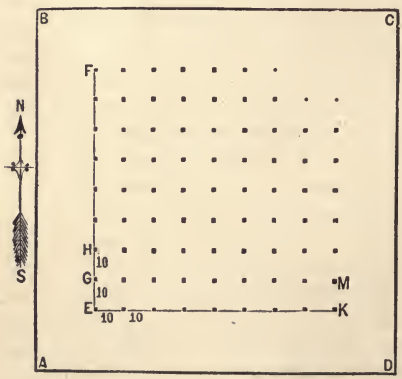

Fig. 70.
Staking out orchards.

Next, take a strip of board, say about eight feet long and six inches wide, as shown in Fig. 71, and cut a notch in one side at the middle, just large enough to let in the stem of a tree. Bore a hole through each end, exactly at equal distances from this notch. Then, whenever a tree is to be planted, place the middle notch around the peg, and thrust two other pegs through the holes at the ends. Then take up the board, leaving these two pegs, dig the hole, replace the board, and set the tree in the notch. Proceed in this

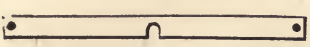

Fig. 71.

Fig. 72.

way till the whole orchard is planted. It is obvious that the trees will stand precisely where the first pegs were placed, and will range in perfect rows. A large number or series of the two pins may be set successively by the board, so that a number of workmen may be digging and planting at the same time. It is of no importance in what direction the board is placed, as the pin and the tree will occupy the same spot, as shown in Fig. 72, the row extending from *a* to *b*.

Transplanting. Very few fruit or ornamental trees ever remain where they first came up from seed, but nearly all are removed one or more times, to the spot where they are finally to remain. For this reason, transplanting becomes a most important operation. If a tree could be removed with all its roots, including the numerous thread-like radicles, and all the spongelets, and placed compactly in the soil, precisely as it stood before, it would suffer no check in growth. The nearer we can approach this condition, therefore, the greater will be our success.

As a general rule, roots extend as far on each side of the tree as the height of the tree itself. If, for instance, a tree be five feet high, the roots will be found to extend five feet on each side, or to form a circle ten feet in diameter. This rule will not apply to slender trees, which have become tall by close planting, but to those that are strong and well developed. The great length of the roots is often shown by trees which send up many suckers, as the silver poplar and locust, which may be seen to extend over a circle much greater in diameter than the height of the tree.

Many persons "wonder" why trees are so much checked in growth by common transplanting, or why they so often die from the

operation. They would not be surprised, if they saw the common destruction of the roots in taking them up. Fig. 73 represents a nursery tree with its roots entire; the dotted lines show where the spade is commonly set for the purpose of lifting; Fig. 74 is the tree after taken up, when more than nine-tenths of the roots are cut off—sometimes it is as badly mutilated as in Fig. 75. Fig. 76 exhibits the same as removed by careful nurserymen.

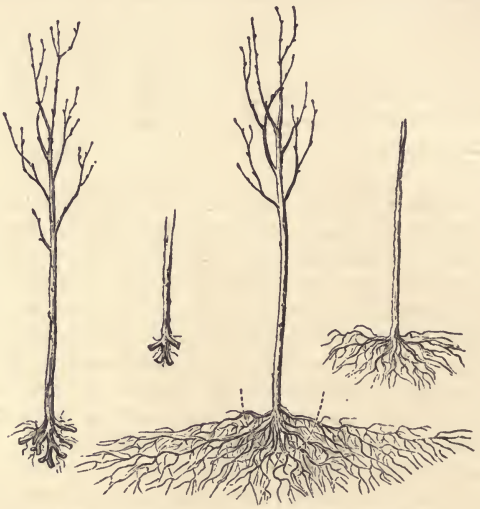

Fig. 74. Fig. 75. Fig. 73. Fig. 76.
Modes of digging nursery trees.

In taking up the tree, the spade should be set into the earth at a distance from the tree, and the whole carefully lifted, not forcibly withdrawn, from the soil. Or, so much of the earth should be separated in a circle by the spade, that when the tree is withdrawn, a large portion of the soil may be lifted with it with the small fibres. In the following figure, *a* indicates the trunk of the tree; *bb* the circle of roots cut off with the spade in a hasty removal; and without this circle, the rest of the roots which are left in the earth (Fig. 77). The same is shown by the dotted lines in Fig. 73.

In ordinary, or even very careful practice, a part of this wide network of fibres must necessarily be separated from the tree. It is evident then, that the usual supplies of sap to the leaves must be in

part cut off. Now the leaves are constantly (during day) throwing off insensible moisture into the air; and good-sized trees thus give off daily many pounds. Reduce the supply from below, and the leaves cannot flourish; and if the reduction is severe, the tree withers and dies.

Fig. 77.

The remedy consists in lessening the number of leaves, so as to correspond with the diminished supply. This may be done by shortening back every shoot of the previous year to one-quarter of its length, and in extreme cases, every shoot may be shortened back to *one strong bud*, just above the previous year's wood. Cutting off large branches at random often quite spoils the shape. Fig. 78 represents an unpruned tree, and Fig. 79 the same with the shoots shortened back.

Where peach and other trees have been once a year trimmed up

Fig. 78.

Fig. 79.

Fig. 80.

Fig. 81.

to a single stem, while in the nursery, the mode of shortening is shown by Figs. 80 and 81.

A few experiments only are needed to convince any one of the advantages of thus cutting in the shoots. Some years ago an orchardist carefully transplanted one hundred and eighty apple-trees into good mellow soil. The roots had been cut rather short in digging. One-half had their tops shortened back, so as to leave only one bud of the previous season's wood; the heads of the other half were suffered to remain untouched. The season proved favorable. Of the ninety which had their heads pruned, only *two* died, and nearly all made fine shoots, many being eighteen inches long. Of the ninety unpruned, *eight* died; most of them made but little growth, and none more than six inches. Both the first and second year, the deep green and luxuriant foliage of the pruned trees afforded a strong contrast with the paler and more feeble appearance of the other. A similar experiment was made with seventy-eight peach-trees, of large size, three years' growth from the bud. One-half were headed back; the rest were unpruned. The season was rather dry, and *twelve* of the thirty-nine unpruned trees perished; and only *one* of those which were headed back. The unpruned which survived lost parts or the whole of the upper portions of their branches; the pruned made fine bushy heads of new shoots. In another instance, trees only one year's growth from the bud, transplanted in the usual manner unpruned, were placed side by side with others of four years' growth, and with trunks an inch and a half in diameter, the heads being pruned to one-quarter their size. The growth of the former was feeble; the large trees, with pruned heads, grew vigorously.

The degree to which this shortening should be carried must depend much on climate. In the cool moist atmosphere of England, the leaves perspire less, and a larger number may remain without exhausting the supply from the roots. In this country the perspiration is more rapid, and fewer leaves can be fed, until new roots furnish increased supplies.

Cutting back after the buds have swollen, or the leaves expanded, seriously checks growth, and should never be performed except on very small trees, or on such as the peach, which quickly reproduce new shoots.

Trees which quickly reproduce new shoots, as the peach, may be more closely shortened back than others having a less reproductive power, as the apple. The cherry throws out a new growth still more reluctantly, and hence more care is needed in digging up the roots entire.

Preparing the roots. Before a tree is set in the earth, all the

bruised or wounded parts, where cut with the spade, should be pared off smoothly, to prevent decay, and to enable them to heal over by granulations during the growth of the tree. Then dip them in a bed of mud, which will coat every part over evenly, and leave no portion in contact with air, which accidentally might not be reached by the earth in filling the hole. The bed of mud is quickly made by pouring into a hole a pail of water, and mixing it with the soil.

Setting the tree. It should not be set deeper than it stood before removal. Setting it upon the surface of the ground without any hole, and placing a bed of fine earth upon the roots to the usual depth, is preferable, and on shallow or unprepared soils, or such as are quite clayey and rather wet, has been quite successful. When placed in the unfilled hole, if it is found to be too deeply sunk, a mound or hillock is to be made under the centre to raise it sufficiently, and the roots separated and extended to their full length. Fine rich mould is then to be sprinkled or sifted over, taking care to fill all the interstices, and using the fingers to spread out all the fibres during the operation. The mellow earth should rise two or three inches above the surrounding surface, to allow for its subsequent settling.

In nearly all soils, *the use of water in settling the earth* among the roots will be found eminently serviceable. Dashing in a few quarts before the hole is quite filled is the more common way; but an admirable mode is to settle the fine earth as it is constantly sifted in, by a regular shower from the watering-pot, one man holding the tree, a second filling in the earth, and the third applying the water. By this process the roots are not disturbed in their position, and every cavity about them is filled in the most perfect manner. The trees will be found to maintain their position better than when pulverized earth alone is used; for although they may at first be easily moved while surrounded by the half-liquid mass, in a few hours the earth around them will absorb the superabundant moisture, and they will become as firm as when they have stood for weeks in their new position.

Stiffening against the wind. Newly-planted trees, being acted on as levers by the wind, often press aside the earth about their stems, and make an opening down to the roots, which in consequence suffer from both drouth and disturbance. There are two ways to prevent this disaster. In autumn transplanting, the best way is to embank a mound of earth about the stems, from ten to eighteen inches high, as the size of the tree may require, Fig. 82.

This mound performs the triple office of stiffening the tree, excluding mice, and covering the roots from frost. Only a few seconds are required to throw up one of these conical heaps of earth. After the tree commences growing, the mounds are removed. Trees which have had their heads lightened by the shortening process already described, will not often need any other protection.

But when the trees are large, or the situation is windy, *staking* becomes necessary. If driven before the roots are covered, the stakes may be erect, as in Fig. 83; if driven afterwards, they may be slanting; and in both cases straw bands should be first wrapped once round, to prevent the trees from chafing.

The accompanying figure (84) shows the mode in which the stake is driven into the bottom of the hole before filling in.

Fig. 82.

Fig. 83.

Fig. 84.

Transplanting trees on the surface.

Fig. 85.

On another page the advantages are pointed out of sometimes setting trees on the surface of the soil. This mode of transplanting is undoubtedly the best on all heavy soils that cannot be thoroughly drained. The annexed figure (85) exhibits distinctly this mode of planting, the dotted line indicating the common surface of the earth, on which the tree is set, and the low mound raised upon the roots. This not only gives the roots a deeper soil, but prevents the water from settling among them. By throw-

ing the furrows occasionally towards the rows, the raised surface will be maintained, and a furrow left between for drainage.

Watering. A very common error is the belief that trees need frequent watering before they are in leaf. Deluging the roots while in a partially dormant state, is as hurtful to trees as to green-house plants, and a continued repetition of it is almost certain death. When a plant is in a state of rapid vegetation, large quantities of moisture are drawn up by the leaves and thrown off; but while the buds are unexpanded, the amount consumed is very small. Fruit-trees sometimes remain with fresh and green branches, but with unswollen buds, till midsummer. Instead of watering such at the roots, let the tops be wet daily at evening, and it will in nearly all cases bring them into active growth. When the tree is much shrivelled, wrapping it loosely in straw, or better, in moss, and keeping the whole in a damp state, will in most cases restore it.

After the leaves are expanded, a more copious application of water becomes useful; but it should never be performed, as so frequently done, by flooding the tree at one time and allowing it to dry at another; or by pouring the water on the surface, which it hardens, and never reaches the roots. Keeping the soil finely pulverized, and if necessary, with an additional shading of hay or straw thickly spread over the surface, will preserve a sufficient and uniform degree of moisture.

The following sucessful treatment in transplanting, in cases that appeared almost hopeless, was practised by the late S. G. Perkins, of Boston:

"Some ten years ago I imported from Paris two hundred and ten pear-trees on quince-stocks, whose roots, on their arrival, I found to be entirely black and dead. I shaved off with a drawing-knife all the roots down to the stump. These I planted in trenches, tying them to crossbars to keep them firm, and then filled up the trench with good soil. The heads and bodies of these trees were regularly washed in dry weather until they began to sprout, which most of them did in abundance during the summer, and I finally saved out of the whole number one hundred and seventy-four, which became as well rooted and as good trees as any in my garden.

"This has happened more than once. Three or four years ago I imported, among other trees, twenty plum-trees, from six to seven feet high, the heads of which had been budded the previous year in France. These buds had grown from nine to twelve inches long, and were perfectly fresh when they arrived; but the roots, on examination, were found entirely dead. Two of these I gave away

One was good for nothing, and the other seventeen I planted in my garden, having cut out all the roots that had fibres, they being entirely dead. One of my men said I might as well plant my walking-stick. Sixteen of these are now flourishing trees, well grown and well rooted, new roots being induced by means of washing the upper part of the tree."

Watering the roots, even of fast-growing trees, will rarely become needful if the soil is deep and is kept mellow. But whenever it is performed, the surface earth should be thrown off, the water poured in, and the earth replaced. This will admit the water at once to the roots, and leave the surface mellow; while by watering the top of the ground, the water will perhaps fail to reach the dry soil below, but only serve to harden and bake the surface.

Mulching, or covering the ground about a tree with straw, coarse barn-yard litter, or, what is still better, leaves from the woods, will in nearly all cases obviate the necessity of watering. It is an excellent protection against midsummer drouths, which so often prove destructive to newly-transplanted trees after they have appeared in leaf, and is a good substitute for mellow culture in places where good cultivation cannot be given. It should never be omitted for newly set cherry-trees. A correspondent of the Horticulturist mulched fifty trees out of one hundred and fifty, all of which had commenced growth alike. Those which were mulched all lived. Of the hundred not mulched, fifteen perished. The weather was hot and dry at midsummer.

Trees received from a distance, and injured by drying, should immediately have their roots coated by immersion in a bed of mud; and then the whole stems and branches buried in moderately moist earth for a few days. They will gradually absorb moisture, through the pores in the bark, and resume their freshness. Plunging into water, as sometimes practised, is more liable to induce decay by water-soaking.

Season for Transplanting. Trees may be removed from the soil at any time between the cessation of growth in autumn and the swelling of the buds the following spring. The operation may be performed first in autumn with those which drop their leaves soonest; but any tree, when not growing, may, by stripping its leaves, be removed safely. If left on, they will invariably cause the shrivelling of the bark, in consequence of the large amount of moisture they are always exhaling, and which cannot be restored through the roots while they are out of the ground.

The rule must vary somewhat with circumstances. Tender trees,

as the peach and apricot, generally succeed best if set in spring, unless in a warm, dry soil, in a sheltered place, and in a climate not severe. It may be added, that soils rather wet, or liable to become soaked with water before freezing, should never receive trees in autumn. The rule should be carried one step farther; such soils should never be set with trees at all. They are unfit until well drained. Much of the "bad luck" that occurs, is from wet subsoils.

As a general rule, all hardy trees are best set in autumn, if soil, aspect, and climate are favorable. They get an earlier start in spring.

It is commonly best to dig up trees in the autumn from nurseries in any case, whether for fall or spring setting. If sent long distances, they will be on hand and may be set out early. They may be heeled in, and be more effectually secured from freezing, than if standing in the nursery rows. In heeling in, select a dry, clean, mellow piece of ground, with no grass near to invite mice; dig a wide trench, lay in the roots sloping (Fig. 86), and cover them and half the stems with fine mellow earth; *fill in carefully and solid all the interstices among the roots;* doing this work imperfectly often results in loss; if well performed, it never can. If much danger is feared from mice, it is better to place the trees erect in the trench (Fig. 87), and round up the whole surface about them; but, being more exposed in this position, they should be placed in a sheltered situation from the winds.

Fig. 86.
Heeling-in sloping.

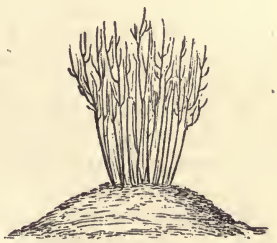

Fig. 87.
Heeling-in erect.

With the precautions above mentioned, it is, however, a matter of small consequence at which season trees are put out, provided the work is well done. It is *at least a hundred times more important to give them good mellow cultivation afterwards.* Here is

where so many fail. Some dig little circles about their trees, which is scarcely better. The whole surface must be cultivated. It is for this reason that trees often do best set in spring—because in one case the soil settles, hardens, and crusts through winter, but is left mellow after spring setting. This difference could not exist if the mellowing of the soil were properly attended to.

When the soil is a heavy clay, and holds water like a tub, tender trees are in great danger from autumn transplanting, unless provision is made for draining the holes, which may be effected by running a deep furrow from one hole to the other, along the line of trees, and using brush, corn-stalks, or straw, as a temporary underdrain for the water to soak away.

Transplanting may be performed in winter, whenever the ground is open and the air above freezing; but roots which are frozen while out of the ground, will perish unless they are buried before thawing.

The *size* for transplanting must vary with circumstances. Five to six feet high is commonly large enough, but those much larger may be successfully removed if they have been previously prepared by shortening the long roots to induce the emission of a mass of smaller fibres near the centre or stem. This is done one year previously, by running a spade into the earth in a circle about the foot of the stem, if the tree yet stands in the nursery, or by cutting a circular trench around the tree if it is a large standard in open ground.

On a review of the essential requisites for successful transplanting, they may be summed up briefly as follows:

1. A previous preparation of a rich deep bed of mellow earth to receive the roots, and land which cannot be water-soaked.
2. Removing the tree with as little mutilation of the roots as practicable.
3. Paring off the bruised parts.
4. Shortening-in the head, in a greater or less degree (before the buds swell), to correspond with the necessary loss of roots.
5. Immersing the roots in mud.
6. Filling the fine earth carefully among the roots, spreading them all out with the fingers.
7. Planting no deeper than before.
8. Staking or embanking, when necessary, to prevent injury by the wind.
9. Watering the stems and branches only, before the appearance of the leaf.
10. Mulching, where danger of midsummer drouth is feared.

The following additional rules, self-evident to men of experience, are continually disregarded by novices in setting out orchards and fruit gardens:

1. If the roots of a tree are frozen out of the ground, and thawed again in contact with air, the tree is killed.

2. If the frozen roots are well buried, filling all cavities before thawing any at all, the tree is uninjured.

3. Manure should never be placed in contact with the roots of a tree, in setting it out, but old finely pulverized earthy compost answers well.

4. A small or moderate sized tree at the time of transplanting will usually become large and bearing sooner than a larger tree set out at the same time, and which is checked in growth by removal.

5. To guard against mice in winter with perfect success, make a small, compact, smooth earth mound nearly a foot high, around the stem of each young orchard tree.

6. The roots of a tree extend nearly as far on each side as the height of the tree; and hence to dig it up by cutting a circle with a spade half a foot in diameter, cuts off more than nine-tenths of the roots.

7. Watering a tree in dry weather affords but temporary relief, and often does more harm than good, by crusting the surface. Keeping the surface constantly mellow is much more valuable and important—or if this cannot be done, mulch well. If watering is ever done from necessity, remove the top earth, pour in the water, and then replace the earth—then mulch, or keep the surface very mellow.

8. Shrivelled trees may be made plump before planting, by covering tops and all with earth for several days.

9. Young trees may be manured to great advantage by spreading manure over the roots as far as they extend, or over a circle whose radius is equal to the height of the tree, in autumn or early winter, and spading this manure in in spring.

10. Never set young trees in a grass field, or among wheat, or other sowed grain. Clover is still worse, as the roots grow deep, and rob the tree-roots. The whole surface should be clean and mellow; or if any crops are suffered, they should be potatoes, carrots, turnips, or other low-hoed crops.

11. Constant, clean, and mellow cultivation is absolutely necessary at all times for the successful growth of the peach-tree, at any age; it is as necessary for a young plum-tree, but not quite so much

so for an old one; it is nearly as essential for a young apple-tree, but much less so for an old orchard; and still less necessary for a middle-aged cherry-tree.

Registering Orchards. Much inconvenience and often many mistakes arise from not preserving the names of varieties in young orchards. The trees are received, correctly labelled, from the nursery; the labels are left on till the wires cut the limbs, or until effaced by time, and the sorts are forgotten. In a few years the trees begin to bear, but the names being gone, the owner consults his neighbors, and probably receives very erroneous names, and thus misnomers are multiplied for want of a timely record.

DISTANCES FOR PLANTING TREES.

Persons about to plant orchards and fruit-gardens, are often at a loss to know the most suitable distances to place the trees. The guiding rule should be to allow space enough that when the trees attain full size, the sun's rays may freely enter on each side. The roots as well as the tops should have free space. As a general rule, the tops should never approach nearer than one-half their diameter.

Some varieties of the same kind of fruit grow to a much greater size than others, but as an average, the following distances may be adopted, varying with the amount of land and with the wishes of the owner, whether to obtain *immediately* a large amount from a small space, or to make a permanent orchard that shall long continue without becoming crowded.

Apples. In fertile districts of the country, where the trees may attain great size, and where there is plenty of land, forty feet is the greatest distance required. The usual distance is two rods or thirty-three feet. Where the most is to be made of the land, and where thinning-in the limbs is practised when the trees become too large, twenty-five feet distance may be adopted. For pyramids on apple-stocks, fifteen feet; for pyramids or dwarf standards on Doucain stocks, ten feet; for dwarf round-headed trees on paradise stocks, eight feet.

Pears. Large growing standard varieties, on pear-stocks, twenty to twenty-five feet; dwarf standards on quince (with stems pruned up, two or three feet, the heads with natural growth, or slightly thinned by pruning but once a year, for orchard culture), twelve feet; pyramids on pear-stocks, twelve to fifteen feet; on quince, ten or twelve feet. It should never be forgotten that pears or

quince should be so placed as to admit of high or enriching cultivation.

Peaches. It is usual to allow about twenty feet for peach-trees that are never shortened-in, but permitted to spread out and take their natural course. But if shortened-in annually as they should be, or even triennially, by cutting back three-year branches, they may occupy only twelve or fifteen feet. Peach-trees budded on the plum, which reduces their growth a little, may be kept cut back so as to require a space of only eight or nine feet.

Cherries. Common standards, twenty feet apart; pyramids on common stocks, fifteen feet; on Mahaleb stocks, ten feet. Dukes and Morellos require only three-fourths of this space.

Plums. Standards, fifteen feet; pyramids, eight to ten feet.

Apricots. One-fourth more space than for plums.

Quinces. Six to eight feet.

Grapes. Most vigorously growing native sorts, on enriched soils, may be ten to fifteen feet apart; on a poorer soil, moderate growers may be six to eight feet apart.

Gooseberries and Currants. Four to five feet.

Raspberries. Three or four feet, in rows five feet apart.

Blackberries. In rows eight feet apart.

For the above distances, the following is the number of trees required for an acre:

40	feet apart,	27	trees.
33	"	40	"
25	"	69	"
20	"	108	"
15	"	193	"
12	"	302	"
10	"	435	"
8	"	680	"
6	"	1,208	"
4	"	2,720	"

CHAPTER VII.

CULTIVATION OF THE SOIL.

In passing through the country, and visiting the grounds of fruit-growers, and examining the exhibitions of pomological societies, a marked difference is observed in the same variety as grown on different grounds. In one case it is small and poor flavored; in another it is large, beautiful, rich, and excellent. The owner of the poor fruit is much disappointed in what he expected to see, and considers himself as "badly humbugged" by the nurseryman who sold him the trees. The successful cultivator takes his specimens to a fair, and sweeps off the premiums by their delicious quality and excellent appearance. Now, this question at once arises: What is the cause of this difference? And it is just such questions as we like to hear asked.

The first, and perhaps the most prominent cause, is *cultivation.* Place a tree in grass-land, or give it no cultivation—let the surface become baked hard, like flagging, or allow weeds to cover the surface—and the tree will have a feeble growth, and the fruit, as a necessary consequence, will partake of the condition of the tree. A feeble tree will, of course, bear small fruit. Hence, one reason why young trees often produce larger and finer specimens than old and stunted trees. Cultivation alone has often changed both size and quality in a surprising degree. Some years ago a few trees of the Seckel pear were observed to bear very small fruit—they were then standing in grass. Subsequently the whole surface was subjected to good cultivation. The next crop had pears at least triple the size of the former. A St. Ghislain tree, on another place, bore at first when standing in grass-land, and disappointment was felt by the owner at the small size and poor quality of the fruit. A herd of swine accidentally rooted up the grass and reduced the ground to a mellow surface. The pears that year were greatly increased in size, and so much improved in flavor that they would not have been recognised as the same sort. The Duchess Angouleme, when

large and well grown, is an excellent fruit. When small, it is perfectly worthless. T. G. Yeomans, of Walworth, N. Y., who has been eminently successful in its cultivation, and obtained thirty-five dollars per barrel for it, has found high culture of vital importance, and has remarked that when the specimen does not weigh over four ounces, it is no better than a raw potato; and this, we think, has generally been found true. There is no question whatever that this fine pear, as well as many other fruits, has been placed on the rejected list by some planters for want of good management and proper cultivation.

Good cultivation and thinning the crop cause all the difference between those superb specimens of the pear which often grace the extended tables, and fill the vast halls of our finest fruit exhibitions, and such miserable fruit as we sometimes see borne on the grass-grown, weed-choked, mice-gnawed trees of the slipshod farmer's grounds—planted out with hardly the expectation, but rather with a sort of dim hope that they would grow and take care wholly of themselves.

One of the best things that a horticultural or pomological society could do, would be to place conspicuously on exhibition a collection of such fruit as might be raised with every advantage resulting from good culture and judicious thinning; and another collection beside it with all the marks of small size and scabbiness which might be expected from utter neglect. One collection should be marked, "FRUIT RAISED UNDER THE EYE OF VIGILANCE AND INDUSTRY:" the other labelled, "FRUIT GROWN UNDER NEGLECT."

Cultivation is the more important, because it is not commenced and finished in a day, but needs constant attention for years; and in ordinary practice it receives greater neglect. For, of the thousands of trees which are every year transplanted in all parts of the country, the assertion may be made with safety, that *more are lost from neglected after-culture, than from all other causes put together.*

To purchase and set out fine fruit-trees of rare sorts, in a baked and hardened soil, whose entire moisture and fertility are consumed by a crop of weeds and grass, might very aptly and without exaggeration be compared to the purchase of a fine horse, and then perpetually to exclude him from food and drink.

Here is the great and fatal error with a large portion who attempt the cultivation of fruit. We may not incorrectly divide these into three classes:

1. Those who, having procured their trees, destroy them at once

by drying them in the sun or wind, or freezing them in the cold, before setting out.

2. Those who destroy them by crowding the roots into small holes cut out of a sod, where, if they live, they maintain a stunted and feeble existence, like the half-starved cattle of a neglectful farmer.

3. Others set them out well, and then consider their labors as having closed. They are subsequently suffered to become choked with grass, weeds, or crops of grain—some live and linger, others die under the hardship; or else are demolished by cattle, or broken down by the team which cultivates the ground.

The annexed cut is a fair exhibition of the difference in results between neglected management, as seen on the left, and good cultivation, on the right, as seen in trees five to ten years after transplanting.

Fig. 88.

Neglected trees. *Well cultivated orchard.*

A neighbor purchased fifty fine peach-trees, handsomely rooted, and of vigorous growth; they were well set out in a field containing a fine crop of heavy clover and timothy. The following summer was dry; and a luxuriant growth of meadow-grass nearly hid them from sight. What was the consequence? Their fate was precisely what every farmer would have predicted of as many hills of corn, planted and overgrown in a thick meadow—very few survived the first year.

Another person bought sixty, of worse quality in growth; he set them out well, and kept them well hoed with potatoes. He lost but one tree; and continuing to cultivate them with low-hoed crops, they now afford yearly loads of rich peaches.

Another neighbor procured fifty good trees. Passing his house the same year late in summer, he remarked: "I thought a crop of wheat one of the best for young peach-trees!" "Just the reverse; it is one of the worst—all sown crops are injurious; all low-hoed

ones beneficial." "Well," answered he, "I have found it so—my fifty trees all lived, it is true, but I have lost one year of their growth by my want of knowledge." On examination, they were found in excellent soil, and had been well set out. All the rows were in a field of wheat, except one, which was hoed with a crop of potatoes The result was striking. Of the trees that stood among the wheat, some had made shoots the same year an inch long, some two inches, and a very few, five or six inches. While on nearly every one that grew with the potatoes, new shoots a foot and a half long could be found, and on some the growth had been two feet, two and a half, and even three feet. Other cases have furnished nearly as decisive contrasts. An eminent cultivator of fine fruit, whose trees have borne for many years, remarks: "My garden would be worth twice as much as it is, if the trees had been planted in thick rows two rods apart, so that I could have cultivated them with the plough. Unless fruit grows on thrifty trees, we can form no proper judgment of it. Some that we have cultivated this season, after a long neglect, seem like *new kinds*, and the flavor is in proportion to the size."

The *thick rows* here alluded to, may be composed of trees from six to twelve feet apart in the rows. This mode admits of deep and thorough cultivation, and the team can pass freely in one direction, until close to the row, where the soil need not be turned up so deeply, or so as to injure the roots. Fig. 89 exhibits this mode of planting, and Fig. 90 another mode, where the trees are in hexa-

Fig. 89.

Fig. 90.

gons, or in the corners of equilateral triangles, and are thus more equally distributed over the ground than by any other arrangement. They may thus be cultivated in three directions. For landscape effect, this is undoubtedly better than any other regular order.

Trees are frequently mutilated in cultivating the ground with a team; to obviate this difficulty, arrange the horses when they work near the line of trees, one before the other, or *tandem*. Let a boy ride the forward one, use long traces and a *short whipple-tree*, and place the whole in the charge of a careful man who knows that one

tree is worth more than fifty hills of corn or potatoes, and no danger need be feared. In the absence of this arrangement, oxen will be safer than horses. A strong single horse will be sufficient for working near the rows, where the plough should run shallow, provided the soil is not hard.

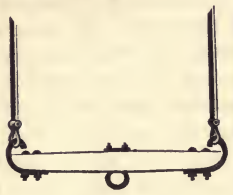

Fig. 91.

The annexed cut (Fig. 91) shows a mode of constructing whipple-trees for this purpose, so as to pass the trees freely. It is made as short as the free action of the animals' legs will allow (about sixteen inches for a single whipple-tree). An iron strap is riveted so as to bend round the end of the wood, turning in and forming a hook inside.

In very small trees, most of the roots are within a few feet of the stem, but their circumference forms an annually increasing circle. Hence the frequent practice of applying manure, or digging the ground closely about the base, as exhibited in the annexed figure (92), is comparatively useless. Hence, too, the practice of

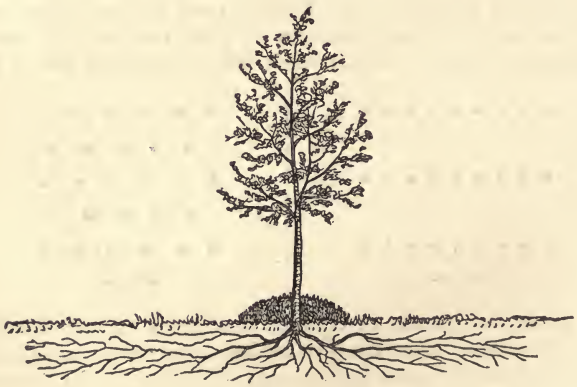

Fig. 92.

ploughing a few furrows only on each side of a row of large trees in an orchard, is greatly inferior to the cultivation of the whole surface.

Among the crops which are best suited to young trees, are pota-

toes, ruta-bagas, beets, carrots, beans, and all low-hoed crops. Indian corn, though a hoed crop, is of too tall a growth, shading young trees too much by its formidable stalks. All sown crops are to be avoided, and grass is still worse. Meadows are ruinous.

A chief reason of the fatal effects of sown crops, is the impossibility of mellowing the ground by repeated cultivation. For this reason, a low crop of peas has been found much worse than a heavy growth of Indian corn.

Renovating Old Trees. When old trees become feeble, there is no better way of imparting to them vigor than by *manuring*. Instead of adopting the more common practice of digging a circular trench around them and filling this with manure, the operation may be performed in a more perfect and efficient manner by digging narrow radiating trenches from within a few feet of the trunk, directly from it—this will prevent cutting many of the roots. The annexed diagram (Fig. 93) will show the position of these trenches. These may then be filled with a *compost*, made of turf, stable manure, ashes, and perhaps a little bone manure—the turf to be the chief constituent, say one-half or two-thirds—and the ashes say one-thirtieth. The bone manure is not essential, as its constituent parts are in common manure in small quantities. If this is done in autumn, the roots will be prepared to penetrate it early in spring, and if the tree is not past recovery, it may make a new growth. The roots probably reach as far each way as the height of the tree, and the trenches should extend about the same distance. They need not be cut very near the tree, as the roots are all large there, and would be more likely to be injured and would be little benefited. The trenches should be only the width of a spade, and be from two to four feet apart.

Fig. 93.

Old apple orchards always grow and bear best when kept under cultivation. If the soil is, however, naturally or artificially fertile, they succeed well in grass continually grazed short by sheep and swine. These animals are useful in devouring the insects of the fallen fruit, and assist in manuring the surface. An annual autumn application of yard or stable manure, with a small portion of ashes—or, in the absence of ashes, of lime—will commonly be useful. If

the orchard is only top-dressed, the application in autumn is of great importance, that the soil may be soaked in winter or spring. If ploughed in it should be done in spring, after the manure has remained all winter on the surface.

When to Manure Orchards. Inquiry is often made as to the frequency and amount of manuring or cultivation for trees. The answer must be: *act according to circumstances.* The question again recurs: how shall we know what our soils need? The answer is: *observe the results of growth.* An examination or analysis of the soil will be of little use. But the trees will tell their own story. If the soil is so rich that they make annual shoots of two or three feet or more in length, without any cultivation or manuring at all (which, however, is rarely the case), then it will be needless to give additional care. *The annual growth is the best guide to treatment.* There are very few apple or other orchards which, after reaching a good bearing state, throw out annual shoots more than a foot or a foot and a half long, and many not half this length. The owner may lay it down as an unalterable rule, that when his trees do not grow one foot annually, they need more manuring or cultivation, or both. By observing the growth he can answer all questions of the kind referred to, without difficulty.

Management of Western Orchards. Lewis Ellsworth, one of the most successful and intelligent fruit-growers in Illinois, says that the loss in fruit-trees in that State within the last three years, is *millions of dollars*—that it is attributed to the cold winters and dry summers. But he asserts that to a great extent, this result has arisen from their standing *unprotected* in a soil underlaid with a retentive clayey-loam subsoil, which characterizes most of the prairie land. He has adopted the practice of ridging his land, by repeated ploughings, commencing at the same ridges and ending at the same dead furrows; and where nursery-trees were formerly thrown out by freezing, after ridging they stand throughout the winter without injury, and make a better growth in summer. He recommends the ridging system for all orchards, each row of trees being placed on the centre of the ridge.

We have no doubt that draining would lessen the effects of severe winters on fruit-trees in other regions than the West.

Arrangement to facilitate Cultivation. The following is an arrangement of kinds of different sizes, into rows for cultivation both ways with horse-labor. The larger sorts are in wide rows, as explained on page 72. Fruits which are stung by the curculio are planted at one end, and when the fruit is forming, pigs and

geese are confined to that part by the hurdle-fence *a a*, run across for the occasion.

Fig. 94.—*Fruit garden.*

A plan of a fruit-garden, arranged in a similar manner, with full details, is given in Chapter XI.

Implements for tilling Orchards.—It is important, after trees have begun growth in spring, to injure the roots as little as possible in cultivating. On this account Shares' harrow is an admirable implement, as it rides over the roots without tearing them up. The smoothing harrow operates in a similar way, forming a very smooth surface, and is therefore successfully employed toward the latter part of the season for giving the ground a finish, to fit it for receiving the falling fruit, or for driving a wagon easily among the trees for gathering the crop.

CHAPTER VIII.

PRINCIPLES AND PRACTICE OF PRUNING.

A GREAT deal has been said and written on this subject, and much bad practice still prevails. Orchards are seen all through the country which have either been never pruned, or, if the work has been performed, it has done more harm than good. Trees with trunks trimmed up to three times the proper height, mutilated by the needless lopping of large branches, one-sided and totally destitute of symmetry, or filled with a mass of brush, may be seen through the country. A perfect orchard is a rarity. The same remark will apply to nurseries. The trees have been grown and trained with very little attention to a perfect shape, the chief object of the owner being to raise large trees in as little time as possible. The purchasers of such trees, after setting them out, either give little attention, or, if they cultivate them well, allow them to form their own heads. They may be too tall or one-sided, or distorted and irregular, no attention being given to shaping the heads when they are young.

Pruning Young Trees at Transplanting. When young trees are dug from the ground, the roots from necessity are more or less bruised or mutilated. All these bruised or torn surfaces should be pared off smoothly with a sharp knife. If left untouched they induce decay, and are unfavorable to the best healthy growth of the tree—in the same way that a broken or bruised limb above ground would furnish a dead stub or make a bad scar, while pruning it smooth will cause it to heal over readily.

Pruning the Tops. Thrifty young trees usually have roots extending as far each way from the foot of the stem as the height of the tree. A careful examination will discover the whole surface of the subsoil occupied with the small fibres of full-grown nursery-trees (Fig. 95). It is obviously impossible, therefore, in digging up to avoid cutting and leaving most of the roots behind ; and the tree when reset is unable to sustain or feed for a time its leaves and

branches. A part must therefore be cut off to restore the balance, corresponding in some degree with the loss of the roots. This may

Fig. 95.—*Nursery rows—roots extending under the whole surface.*

be done by thinning out all the feeble shoots, so as to leave an even, well shaped head, and then cutting back a part of each remaining one-year shoot (Fig. 96). Judgment must be exercised as to the amount to be cut away from the tops. The growth of new roots depends on the assistance afforded by the leaves at the top; if the leaves are too few, the roots will not extend freely; if they are too many, the roots cannot furnish proper supply for them, and they will be feeble and sickly. Planters will learn a great deal on this point by cutting away more or less on different trees, and observing the result. Different kinds of trees require varying management in this respect. The peach, for example, readily reproduces new shoots, and it may, consequently, be cut back very freely; two-thirds to nine-tenths of each previous season's shoot may be removed without detriment. The grape, also, may be very heavily pruned, as it throws out new vines with great vigor. The cherry, on the contrary, is very sensitive, and young trees have been nearly killed by a severe summer pruning. The young cherry shoots should never be cut back in spring more than half their length. The pear and apple are intermediate, and the heads should be moderately and not severely pruned.

Fig. 96.—*Figure of thinned and shortened-back young tree.*

The mutual relation between the roots and leaves has been already alluded to. The leaves cannot exist without the moisture received through the roots; and the roots cannot grow without the nourish-

ment afforded by the leaves. The only exception is the temporary supply furnished by the cells in the body of the tree. New roots are commenced before the leaves expand, as may be seen on young seedlings, the roots of which have been trimmed, and where the new white fibres protrude just as the buds are swelling. The same occurs on the roots of trees transplanted in autumn, after the leaves have fallen; but this effect is only temporary, continued growth requiring that both leaves and roots should work together. On the other hand, the nutriment laid up in the cells will sometimes supply the leaves for a short period, provided care is taken to furnish the requisite moisture at their surfaces by means of a bell-glass to retain a damp atmosphere. Cuttings are often thus started, a small portion of leaves being allowed to remain upon them to assist in the emission of new roots. But, if the leaves are placed in a dry air, they soon pump out and carry off the moisture, and the shoot, leaves and all, withers in a short time. If all the leaves had been cut off, the shoot would remain plump much longer—a fact well known to nurserymen and others who preserve scions for budding.

Proper Time for Pruning. Many cultivators have been misled into the opinion that early summer is the best time to prune, from the fact that the wounds heal more readily. Pruning after the tree has commenced growth has a tendency in nearly every instance to check its vigor. For this reason, where the rapid formation of young wood is desired, the work must be performed before the buds begin to swell. Some planters have objected to shortening-in the shoots of newly-set trees, because by doing the work too late, or after the leaves were partially or wholly expanded, they have injured and not benefited them. Any one may easily satisfy himself on this point by pruning-back the heads of a dozen trees early in the season, and leaving those of another dozen until the leaves have opened. They will present the appearance represented in the following figures, before the close of summer—the first (Fig. 97), with strong, thrifty shoots; the latter (Fig. 98), with short, stunted growth.

There may be an exception to this general rule, where a slight amount of pruning in summer, not sufficient to produce any material check in growth, may be useful in improving the shape of the tree; such, for example, as the removal of an occasional unnecessary shoot or one-sided branch.

As fresh wounds always render trees more liable to be affected by intense cold, quite hardy trees only may be pruned any time during winter. On those inclining to be tender the operation should be deferred till towards spring.

Pruning, as affecting Fruitfulness. As a general rule, the rapid formation of leaves and wood is adverse to the production of fruit. On the other hand, the slow growth of the wood favors the forma-

Fig. 97.—*Head of young tree pruned before the leaves had expanded.*

Fig. 98.—*Head of young tree pruned after the leaves had expanded.*

tion of fruit-buds and the production of heavy crops. These two adverse tendencies may be more or less controlled by pruning.

When the too numerous branches of a tree produce more leaves than can be properly supplied with nourishment, resulting in a feeble or diminished growth, new vigor may be often imparted by judicious pruning, directing the sap into a smaller number of channels, and thus increasing its force; for example—peach trees, after bearing some years and yielding smaller fruit than on fresh young trees, will assume all their former thriftiness by partly cutting-back the heads. Dwarf pear-trees, which have not been sufficiently manured and cultivated, whose pruning has been neglected, and heavy bearing allowed for a number of years, have been restored by severely pruning-back the branches and thinning out the fruit-spurs. In all such operations as these, it is indispensable to observe the rule already given to do the cutting-back in winter or early in spring, before the buds have swollen. If trees are too thrifty and do not bear, a check may be given, and many of the leaf-buds thus changed to fruit-buds by a continued pinching-back during summer.

The production of fruit-buds may be accomplished artificially by checking the growth of vigorous trees; but such treatment, out of

the ordinary course of nature, though sometimes useful, should be cautiously applied, as the first crop gives still another check, and often materially injures the tree and the quality of its subsequent crops.

Summer Pruning. Another and an unobjectionable mode of attaining the same end, is *summer pruning*, which is effected by pinching off the soft ends of the side-shoots after they have made a few inches growth. In these the sap immediately accumulates, and the young buds upon the remainder of these shoots, which otherwise would produce leaves, are gradually changed into fruit-buds. To prevent the breaking of these buds into new shoots by too great an accumulation of the sap, a partial outlet is left for its escape through the leading shoot of the branch, which at the same time is effecting the desired enlargement of the tree. In the annexed figure (Fig. 99), a branch is represented with its side-shoots thus undergoing conversion into fruit-spurs, the dotted lines showing the position which these shoots would have taken if left unpinched.

Fig. 99.

It will be seen that two great objects are here attained—the fruitfulness of the tree, and the increased vigor of the leading-shoot, by directing the surplus sap to its growth.

This constitutes essentially the art of *summer pruning* dwarf and pyramidal trees, more especially the pear and apple. It may be applied with advantage to young standards, to produce early fruitfulness.

It often happens, and especially when the pinching is done too early, that the new buds send out shoots a second time the same season. When this occurs, these second shoots are to be pinched in the same manner as the first, but shorter; and third ones, should they start, are to be similarly treated. The bruising given by pinching off with the thumb and finger, is more apt to prevent this result than clipping with a sharp knife.

Giving Desired Form to Trees by Pruning. A tree may be moulded into almost any desired shape by a proper use of the knife, or even by the rubbing and pinching process.* If a young tree from the nursery is too tall and slender, or has too high a top, it

* A late writer says: "The finest standard pear-trees we ever saw, had never had a knife or saw about them. The thumb and forefinger had only been used. Rub off all unnecessary buds that grow in a tree—and remove as they appear. This keeps the tree clean, and the growth in the proper channels. It is easily done."

should not be altered much the first year after removal, but allowed to become tolerably established with its new set of roots. The second year it may be cut back freely (Figs. 100 and 101), taking care to leave buds for the formation of an evenly distributed head. Some kinds of trees will bear cutting-back freely the same year they are removed, as, for example, the peach, which, as already observed, readily produces new shoots. The same characteristic is possessed by the sugar-maple and some other trees, which as many have observed, when planted along the borders of streets, and cut back to single poles, form heads at once of new branches.

Fig. 100.—*Mode of reducing the height of a tall young tree by cutting at the dotted line.*

When the tops are too low (which is rarely the case), the lower branches may be pruned off and the top carried up to any desired height. This should not be done until the stem has thickened sufficiently to sustain the top—the side-shoots always tending to increase the diameter of the stem which bears them. If the young tree possesses great luxuriance it may be desirable to throw more of the growth upward than these side shoots would allow, if remaining till the following spring, the usual time for pruning. In such a case the ends of the side limbs may be clipped or pinched off, and a portion of the lower ones removed with the knife.

Fig. 101.—*The same, after the operation is completed.*

Pruning Nursery and Young Trees. Brief suggestions have been already furnished on this subject in connection with the explanation of general principles. Directions of a more minute and practical character, and applicable to the different kinds of trees, will doubtless be useful and acceptable. It is of great importance that a tree be pruned right, on the start; for the misplaced shoot, which might be easily rubbed off with the finger, when just beginning to grow, may ultimately become the heavy limb and the misshapen top.

Pruning Single Shoots. Young shoots are cut back for various purposes, such as heading down to an inserted bud, shortening-in those that are too long, or cutting out supernumeraries. It is important that even these simple operations be rightly performed

1. The cut should always be made with a sharp knife, which does the work smoother, better, and more completely at the control of the operator. 2. The cut surface should be as small as practicable, in order that it may heal over readily. The two annexed figures show the right and the wrong way of doing this work, Fig. 102 being a well made cut, and Fig. 103 being one performed by a careless workman, exposing a large cut surface and leaving an inconvenient and sharp stub above the bud intended to grow. 3. The cut should not be made too high above the bud, nor too near it. If too high above (Fig. 104), in the space between the buds or joints, this portion, not being fed by leaves, dies, and the wood must be afterwards pruned again in order to make a smooth stem. If the cut is made too near the bud, as in Fig. 105, the drying surface abstracts moisture and enfeebles the bud, which either fails to grow, or grows feebly.

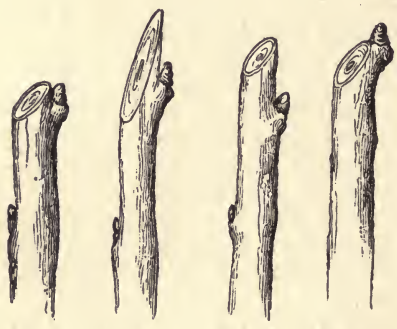

Fig. 102. Fig. 103. Fig. 104. Fig. 105.

Fig. 106. Fig. 107.

Fig. 106.—*Pruning down to inserted bud—the dotted line*, a, *shows the proper place to make the cut*—b, *is too near the bud.* Fig. 107.—*The bud after starting and tying up.*

Trees that are soft and porous, as the peach and grape, should have more wood left above the bud, to prevent drying; and in pruning down to all inserted buds, it is generally safest to leave an inch or two until the young shoot has fairly commenced growing, when the stump may be pared down close to it by a single draw-cut of a sharp knife, made sideways, so that the point of the knife may not strike the shoot (Figs. 106 and 107). 4. In shaping the heads of young trees, prune down to an *inside* bud, where an upright shoot is required;

but prune down to an *outside* bud where a more horizontal or spreading growth is sought, as, for instance, in such vertical growers as the Northern Spy and Early Strawberry apple trees.

Pruning Young Apple-Trees. Directions have been already given in relation to forming a high or low top. In consequence of the crowded growth of nursery-trees, they are apt to push upward to reach the light, at the expense of the side-branches. In addition to this influence, being closely trimmed on the sides to make them tall, such mismanaged trees assume the appearance of the annexed cut (Fig. 108), and have been compared to a low-bowing dancing-master. A better-shaped tree is shown in Fig. 109. As all nursery-trees

Fig. 108.—*Nursery-tree pruned too high.*

Fig. 109.—*Well formed young tree.*

succeed better, are more sure to live, and are more vigorous and make handsomer trees when set out quite young, or at not more than two years from the bud or graft, the following directions apply to such trees at the time of planting and immediately afterwards. Three or four side shoots on the unformed tree (Figs. 110 and 111) should be at first selected, to form the main branches and to constitute the foundation or framework of the future top (see Fig. 96). In order to secure a well formed and nicely balanced head, these shoots must be frequently watched through the first summer of growth, and if any of them are disposed to take the lead of the others they should be pinched and checked to maintain an equality. Two buds will be enough to grow on each of these shoots, making eight at the end of the season, taking care that all are distributed at

equal distances (Fig. 112). All the other shoots should be rubbed off with the thumb and finger as soon as they form. The second year the same process is repeated on the new shoots, and continued until a handsome, even, symmetrical framework for the future head is obtained, after which comparatively little attention will be neces-

Fig. 110.—*Unformed tree.*

Fig. 111.—*Unformed tree, left unpruned till older.*

Fig. 112.—*Well formed head.*

sary. A large orchard of young trees may be managed in this way with a very few days' labor—far less than that afterwards required in cutting out large limbs and giving shape to the distorted tops of full-grown, neglected orchards. These rules will apply, substantially, to the pruning of standard pears, except that they generally require less thinning out.

Nearly the same course is to be pursued in forming the heads of dwarf apple-trees, with the exception that the base of the head should be only about ten inches from the ground (Fig. 18); or, if they be half standards on Doucain stocks, the heads should be about twenty inches or two feet high.

Pyramids. For pyramids (a form of training applied most frequently to dwarf pears), the early treatment is quite different from that of standards. As the sap tends to the summit of the tree, producing the strongest side-shoots towards the top, and the shortest and most feeble towards the bottom, the natural form of the tree gradually becomes a trunk or stem with a branching head. To prevent this result, and give a strong, broad set of branches at the bottom, a thorough and regular system of shortening-down must be adopted at the outset. The following is a brief outline of the course usually pursued:

After the single shoot from the bud has grown one season (Fig. 113), it is cut down so as to leave not over one foot, and if the tree is weak not over six inches (Fig. 114). As a consequence, the buds on this remaining portion, receiving all the sap, make a vigorous growth. The upper one must be converted into a leader, by pinching off early the tips of the others, beginning first with the upper ones, which will be the strongest, and gradually descending as the season advances to the lower ones, which should be left the longest in order to give them the most strength (Fig. 115). Six inches of naked stem below the branches should be left, by rubbing off all shoots below; and if in a region liable to deep snows, this space should be a foot, to prevent splitting off the limbs by the weight of the snow, and for which object the tree should not be cut down lower than eighteen inches at the close of the first season. The pruning after the second year's growth, consists in cutting down again the leader for a second crop of side shoots; and these side shoots, and the new leader, are to be treated precisely as those below were treated the year before. At the same time, the last year's side shoots, on the lower part, are to be cut back (the longest at the bottom so as to give a pyramidal form), in order to insure the growth of the buds upon them. The new side shoots thus caused, may be pinched off so as to convert them into fruit-spurs (according to the process described hereafter in this chapter), except one shoot left on each as a leader, and another, if needed, to fill up the space made by the widening limbs.* The pyramid may now be

Fig. 113. Fig. 114. Fig. 115.

* This summer pinching is intended only for perfect training; in common or orchard management, it is scarcely necessary.

said to have been fairly formed; and it is only requisite to continue and prolong the same process for successive years. Fig. 116 represents a four-year pyramid three times pruned, each section being shown at the figures 1, 2, 3, and the cross-lines indicating the place for the fourth pruning. Fig. 117 represents a perfectly pruned pyramid in bearing.

After the tree has attained sufficient size, its further extension is prevented by pruning back the shoots. If the fruit-spurs become too numerous, a part of them are to be pruned closely out, so as to give an even and not crowded crop.

Fig. 116.—*Four-year pyramid.*

Fig. 117.—*Bearing dwarf pear.*

When spurs become too old, they may be mostly removed for new ones to spring from their bases.

Some varieties of the pear throw out side shoots spontaneously the first year. Such trees may be treated in a manner not unlike the ordinary two-year pyramid. On the contrary, such sorts as have small or flat buds, may need a more severe cutting back than others, in order to arouse the buds into action and induce them to break into shoots.

T. G. Yeomans, a successful cultivator of the dwarf pear for

market, gives the following excellent practical directions for pruning the trees, suited to orchard management:—

"Experience has convinced me, that with good trees of well chosen varieties, on any good corn land which is never too wet; and with the culture a good farmer gives his other crops, and the important—nay more, the indispensable requisite to success—*thorough pruning*, no one need fail of attaining a degree of success highly satisfactory and profitable.

"A dwarf pear-tree should never be planted at one year old. A good one-year-old tree consists of a single upright shoot or stem, from three and one-half to five feet high, and should be cut off at about two feet from the ground; and in order to give a smooth, handsome stem or trunk, let the buds be rubbed off to the height of one foot from the ground—leaving on the upper portion six to nine buds, more or less; with the tree standing in its original position in full vigor, and cut back as above stated, each one of these buds will throw out a good strong branch, which gives a full round distaff form to the tree; and this is the time and manner, and the only time, when that desirable shape can be given, on which the future form of symmetry and beauty so much depends; and to avoid a fork-topped tree, in which the two uppermost branches are about of equal vigor and height, let the second branch from the top be pinched off, when about nine inches or a foot long, which will check and weaken it, while the uppermost one becomes a strong central leader. Whereas, if the tree be transplanted at one year old, and cut back as above stated, the vital forces of the tree will be weakened half or three-fourths by transplanting, and, as the result, only two or three (more or less) of the buds on the trunk will grow so as to form branches, and they, perhaps, only at the top or all on one side, while the remaining buds remain dormant, never afterwards to be developed, as the other branches form new channels, which will more readily carry the sap to the other and upper portions of the tree.

"For transplanting, therefore, let a tree be two years old from the bud, well cut back at one year old, and with six to nine main branches, which form the framework or foundation, which is to give form and character to the future tree, with proper care and management.

"The following cut (Fig. 118) will illustrate a two-year-old tree, as above described, its lower branches about one foot from the ground, its upper branches being the strongest and most upright, and those below less vigorous and more horizontal.

"The dotted lines indicate where the branches should be cut back at the time of planting.

"In cutting a tree, with branches formed as above described, let the leader be cut down within four to six inches of the place where

Fig. 118.

Fig. 119.

the one-year-old tree was cut off, and just above a good bud on the side of the tree, over the previous year's cut, thus keeping the leader in a perpendicular position over the original trunk or bottom of the tree.

"If the side branches are too horizontal, upper buds are left for their extension; if too upright, lower buds are left. Side direction may be given, if desirable, to fill wide spaces, in the same way. Cut the other branches at such a distance from the trunk, that the ends of all of them would form a pyramid, the base of which should not be over twelve to sixteen inches in diameter, and in smallish trees much less; thus the lowest branches will be left the longest; the object of which is to check the natural flow of sap to the upper branches, and induce it to flow more forcibly to the lower ones, increasing the vigor and force of the latter as much as possible, which must be done at that time, or never.

"Fig. 119 represents a two-year-old tree after it has been pruned at two years old, and made the third year's growth, and showing where it should be cut back at that time. All subsequent pruning

will become easy to any one who has attended to these directions thus far—observing the same principles, thinning out or cutting back any secondary or other branches, as shall seem necessary to admit light and air, or give vigor or symmetry of form to the tree; but as the greatest force of sap will flow to the central and upright branches, they will need to be cut back most, retaining as near as may be the pyramidal form; ever bearing in mind this fact, that no one prunes too much; and, after having pruned well and gathered rich harvests of luscious pears, if you still wish to grow them *larger* and *better* than ever before, prune a little closer, and that result will certainly be attained; and the *vigor*, *beauty*, and *longevity* of your trees will be increased thereby."

Throughout the whole process of pruning and training pyramids, as well as every other tree, the frequent error of allowing the shoots and branches to become too thick and to crowd each other, should be carefully avoided. The size and beauty of the fruit, and its perfection in richness and flavor, where there is plenty of room for the full, vigorous, and healthy development of the LEAVES *which supply the material for the growing fruit*, will repay well the labor required for this excellent result.

Dwarf apples (on paradise stocks) are usually trained to a round and rather spreading open head, the same principles to be applied as in forming dwarf-pears, with the exception of the form given to them, and being more dwarfish in growth, less shortening of the shoots is required (Fig. 120).

Fig. 120.—*Dwarf Apple.*

Small, slow growing varieties, as the Melon, Early Joe, Red Canada, Hawley, Jonathan, Ladies' Sweet, Summer Pearmain, Dyer, Lady Apple, and Lowell, may be pruned into pyramids and kept small, so as to stand not further than ten feet apart. Thriftier varieties, on Doucain stock, may be treated in the same way.

The Cherry and Plum may be pruned in the form of pyramids on the same principles as the apple and pear. The Morello and Duke cherries may be treated either as pyramids or as smaller, rounded, open-headed dwarfs.

Pruning Apple-Orchards in bearing. The mode of pruning old

neglected apple-trees, with a view to restoring their vigor and fruitfulness, is more particularly pointed out on another page; it may be only necessary here to remark that the chief requisites to keep steadily in view during the operation, are, 1. To avoid cutting off large limbs except in cases of absolute necessity. 2. To admit light equally into all parts of the tree by thinning out the branches. 3. To remove all crooked or badly growing limbs, and preserve a handsome evenly distributed top. 4. To do the work gradually, or in successive years, and commencing by preference at the top or centre, which will favor an open top. 5. To give a coating on all fresh wounds an inch or more in diameter, of the composition made of shellac dissolved in alcohol, just thick enough to be of the consistence of paint. The surface should be allowed to remain uncovered a few days after the cut is made, in order to become dry. The neatest application is shellac dissolved to the consistency of thick paint in alcohol—the handle of the brush being inserted in the cork, it is kept air-tight in drying, and always ready (Fig. 121); but fine sand, brick-dust, or powdered chalk, mixed with warm gas-tar, is a good application and much cheaper. Grafting-wax does well, and may be applied with a brush when melted, or in the form of thick plasters.

Fig. 121.—*Bottle of shellac and brush.*

Pruning the Peach. No tree requires continued pruning so much as the peach. There is a strong tendency in the terminal buds to push upward and outward, at the expense of the side-shoots, which soon dying, the tree ultimately is composed of long, bare poles with only tufts of leaves at their extremities (Fig. 122). It is well known that young trees bear large, handsome, and excellent fruit, while the old, enfeebled trees yield nothing but small specimens of inferior quality. Continued pruning will prevent this bad result, and preserve the heads of old trees in a state of thrifty growth, and they will continue to yield as large and fine fruit as in the first years of bearing. As the peach always bears its fruit on the previous year's growth, and buds never start from old wood, it is important to keep a continued supply of young wood, evenly distributed throughout the head. This can only be done by continued cutting back. The best way to perform this operation is to commence at the close of winter or early in spring, and cut off the upper half or two-thirds of every one-year shoot. If this process is continued from year to year, in

connexion with cutting entirely out all the feeble shoots where they grow too thickly, the desired object will be fully attained, and the trees, as they grow older, instead of presenting the appearance of Fig. 122, will form the round, symmetrical, evenly distributed heads

Fig. 122.—*Neglected Peach-tree.*

shown in Fig. 123. An important advantage of thus pruning the peach will be the thinning-out of the fruit-buds; and while the tree will bear perhaps only one-third or one-quarter the number of specimens, they will be so much larger as to give as many bushels, while the quality will be incomparably superior.

An objection is made that too much labor is required for this operation. By the use of a good pair of pruning-shears, however, it may be done with great expedition, and half a dozen trees finished in the same time that would be required for a single tree in using the knife.

Fig. 123.—*Well pruned Peach-tree.*

Another mode, more rapidly performed, and answering nearly the same purpose, is to cut off two or three years' growth at a time, from all the longer branches, taking care to leave a sufficiency of young wood, and always cutting back to a fork, so as not to make a dead stub.

In cases where the pruning has been neglected on young trees, until they have attained several years of age, and the shoots have just begun to die out in the centre, a still more wholesale kind of

pruning may be adopted. Three or four feet may be taken off, in cases of necessity, at a single stroke, and if judiciously performed, will convert the broad head which is beginning to become enfeebled, into a smaller, neat, round, and open head, possessing the thriftiness of a young tree, and bearing as large and excellent fruit. Fig. 124 shows the tree before being thus cut back, and Fig. 125 the same, with all the ends of the branches (shown by dotted lines) removed. It must be remembered here, as in all other instances, that the outer shoots must be sufficiently *thinned-back* to admit light to the interior. The shearing, which is sometimes adopted, like that of a common hedge, only thickens the foliage on the outside, and increases instead of diminishing the evil.

Fig. 124.

Fig. 125.

Pruning the Cherry.—The cherry usually needs but little prun-

ing, after the young tree has been properly formed. As wounds made in winter are apt to form gum, and the removal of much foliage in summer injures the tree by checking its growth, the rubbing and pinching process should be exclusively resorted to, in forming an even and well distributed head, nearly in the same manner as already described for the apple. The only care, as the trees become older, is to see that no shoots, by outgrowing the others, form a distorted top.

Nearly the same rules apply to the plum; but as single shoots sometimes make a long growth in one season, an eye must be kept to them, and the necessary rubbing and pinching performed, that they do not outgrow the others.

Pruning the Quince. Young quince trees, as sold by nurserymen in this country, have, in many instances, received no pruning or training, and resemble Fig. 126. To give them a single straight

Fig. 126.—*Unpruned Quince.*

Fig. 127.—*The same, cut back and new stem formed.*

stem, and to impart sufficient vigor to form a good well balanced head, such trees should be cut down near the ground as soon as they become well established, and a single upright shoot allowed to grow for the future tree (Fig. 127). The second year a good head may be commenced, according to the directions given for the dwarf-apple.

Special directions for pruning the Grape, Raspberry, Blackberry, Gooseberry, and Currant, will be found in the chapters devoted to these different fruits.

Pruning the Roots. This has been tried to a limited extent only, and has proved useful in checking over-luxuriant growth attended with unfruitfulness. Its tendency, by lessening the supply of sap,

is to render trees more dwarfish, and operates not unlike grafting on dwarf stocks ; or in the same way, but in less degree, that transplanting produces a like result. It should usually be done early in spring, and with a spade ground sharp and kept solely for this purpose, so that the roots may be cut off smoothly, and not torn or bruised, as with a dull spade. Any required degree of check may be given to the tree by cutting the roots short or near the foot of the stem—a less check by allowing greater length.

CHAPTER IX.

IMPLEMENTS, ETC.

THE more common tools needed are the shovel, the spade, and the hoe, for digging holes, transplanting, and cultivating the ground. The rake is useful in mixing manures with the soil for filling the remote parts of large holes.

The *pruning-knife*, Fig. 128, is a large hooked knife, for removing useless branches. The *pruning-saw* is needed in taking off larger limbs; attached to a handle several feet long, it will reach those at a distance from the ground. The direction of the teeth should be the reverse of the common saw; that is, they should point towards the operator, constituting what is called the *draw-saw*, Fig. 129. Being thus only subject to a *pulling* strain, it does not require so thick a blade as a *thrust-saw*, with the teeth in the usual way. For this reason it is less liable to become broken or twisted. The *bow-saw*, Fig. 130, is a light saw for cutting near the ground.

Fig. 128.

Fig. 129.

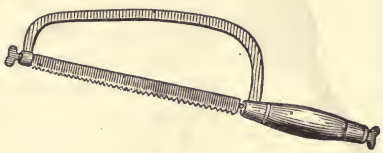

Fig. 130.

The *pruning-chisel* may differ but little from those of a common carpenter, fixed to the end of a long pole or handle, for cutting off small branches at a considerable height. It is placed

against a limb, which is separated by the stroke of a mallet. Small shoots are removed by the hooked part, shown in Fig. 131.

Fig. 131.

The *budding-knife*, Fig. 132, should have a broad, flat blade, the edge of which is to be rounded outwards, for the more ready incision of the bark. The thin ivory blade or *haft* at the extremity of the handle, as the budding-knife is commonly made, may be dispensed with in

Fig. 132.

nearly all cases, the bud when set in, lifting the bark as it slides downwards, more perfectly than by any other mode, after the corners of the bark are lifted with the point of the blade.

The *grafting-tool* (Fig. 133) is useful in cleft-grafting large apple-trees. It may be made of iron, the edge set with steel. It is used for splitting the stock, after it is sawed off and pared. The part A should be two inches broad, with a sharp edge, which should curve inwards, that the bark, in splitting, may be cut first, to give it a smooth flat face. The wedge B opens the stock to receive the graft. By the hook C it is hung on a twig close at hand, when not in use. Another form of the grafting-tool is shown in Fig. 134. Grafting wedges for common use may be made by grinding down large cut nails.

Fig. 133.

Fig. 134

The *grafting-shears*, a recent invention, have effected a great improvement in cleft-grafting, rendering the work much more expeditious and perfect. They consist of a short thin blade of the best steel, A, Fig. 135, two or three inches long, set at an angle of about a hundred and twenty degrees with the handle B, which moves it against a concave bed in the wooden space, C. The angle which the

blade and its bed form with the handles, imparts a *sawing* motion

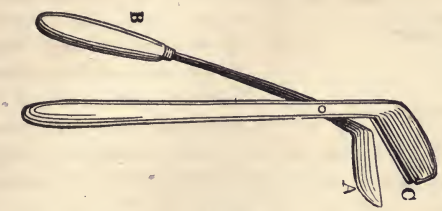

Fig. 135.

Fig. 136.

to the knife, which renders it more effective. It may be used on stocks an inch or an inch and a half in diameter. Pressing the top of the stock from the operator with one hand, it is cut off with remarkable ease by a single stroke given to the shears with the other hand. Another perpendicular stroke slits the stock for the graft, leaving a perfectly smooth face cut for its reception. The expedition and perfection of the work are thus greatly facilitated.

Small *shears attached to a pole* and worked by a cord, Fig. 136, are useful for cutting grafts on tall trees ; in removing the eggs of caterpillars (see chapter on the apple) ; and in taking off fine fruit to prevent bruising, by attaching a basket to the pole immediately under the shears. The blades of these shears, forming an oblique angle with the shaft at a little distance above the pivot, make a *draw-cut* instead of a *crushing-cut*, and are for this reason more effective. Apples, and some of the harder fruits, may also be gathered with a wooden hook in the end of a pole, to draw the fruit from the branch, caught in a basket just underneath.

In using the long-handled pruning-saw, the pruning-chisel, the graft-cutter, or the fruit-gatherer, the operator may stand on a ladder or high stool, as an additional assistance in reaching the higher parts of the tree.

The *orchardist's hook* consists of a light rod, with an iron hook at one end, and a piece of wood made to slide along it. In using it the fruit-gatherer draws down the end of a branch with the hook, and fastens it by the sliding-piece to another branch below. The slider passes freely along the rod, but ceases to slide by the friction of the side-strain whenever it is in use, Fig. 137.

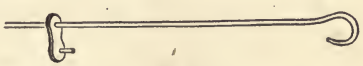

Fig. 137.

Fruit on the ends of long and tall branches may be gathered by means of the fruit-picker shown in the annexed figure (138). It consists of a piece of stiff wire about two feet long, bent into the form shown at *a*; the two ends are then thrust through gimlet-holes in the end of a pole; a small bag, large enough to hold half-a-dozen apples, is sewed to the wire. This completes the instrument. The narrow part of the wire assists in removing the stem from the branch. A picker of this kind is especially valuable in gathering any high-priced fruit, such as pears, which would otherwise be bruised and spoiled.

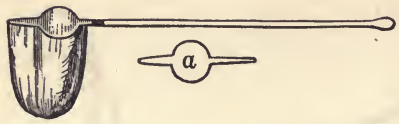

Fig. 138.—*Fruit-picker.*

Vine Scissors. A neat and convenient instrument for thinning out the berries from bunches of grapes which have grown too thick, for removing unnecessary shoots, leaves, etc., and for gathering the fruit, as shown in the annexed cut, Fig. 139.

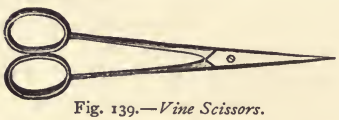
Fig. 139.—*Vine Scissors.*

Garden Reel. Fig. 140 represents the reel for the garden line, and stake for stretching the same, all made of iron. The stakes should be at least a foot long. The line should be a strong well twisted hemp cord, about one-fifth of an inch in diameter, which, when not in use, is quickly wound up on the reel. It is employed for setting trees in rows.

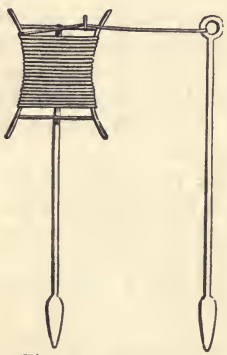
Fig. 140.—*Garden reel.*

Self-sustaining fruit-ladders are very useful in gathering fine fruit, to prevent mutilation and bruising of the bark and branches. Fig. 141 is one of small size and simple construction, is easily carried in one hand, and will raise one's feet a yard or more from the ground. It consists of a small piece of light plank at the top, supported on legs not larger than common chair-legs. Fig. 142 represents one from eight to twelve feet high, the two single legs moving on joints, for closing in carrying, and spreading like a tripod in setting up under the tree.

An improvement has been made by continuing the two main bars to a point, which more readily enables the operator to thrust it up among the branches, and often to support himself by grasping this elevated point. The legs turn at the hinges, *b*. Fig. 143.

Fig. 141.

Fig. 142.

The *folding-ladder* may be closed together with the facility of a pair of compasses; it then becomes a round stick, easily carried in one hand. It is made of strong light wood, and its construction may be readily understood by the annexed figure (144), representing the ladder as open, as

Fig. 143.

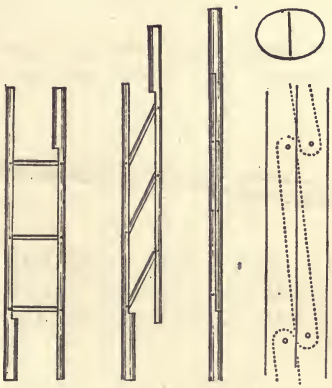

Fig. 144.

half-closed, and as closely shut. An enlarged longitudinal section shows the manner in which the rounds lie in the grooves or concave beds in the sides or styles; above which is a cross-section exhibiting the semi-oval form of the styles. The ends of the rounds turn on iron pins, slightly riveted outside. The rounds resting on shoulders, when the ladder is opened, render the whole stiff and firm.

A ladder of this construction is found very useful, not only in fruit-houses, where a common ladder could not be conveniently carried, but in pruning standard trees, because it can be thrust through the branches like a round pole, without difficulty, and when once there, it is easily opened.

Fig. 145.

Wheel-barrows are of two kinds; Fig. 145 is the simpler or canal barrow, used for wheeling earth, stones, and manure, and is emptied by tipping it on its side; and Fig. 146 is the larger or box barrow, the side boards of which may be removed for unloading, or for receiving larger articles than would enter the box.

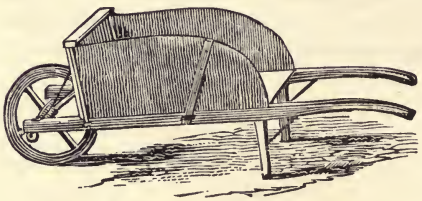

Fig. 146.

Tree scraper (Fig. 147). This is used for removing the rough and shaggy bark, moss, etc., from old fruit-trees. It consists of a triangular plate of steel, attached to a handle at the centre. The sides of the triangle are about four inches, and the handle may be from one to several feet in length.

Fig. 147.

Garden Syringe (Fig. 148). This is made of various sizes, of different materials, and with different caps or orifices. The cheapest is made of thick sheet-tin, and the best and most durable of brass. For throwing a single stream,

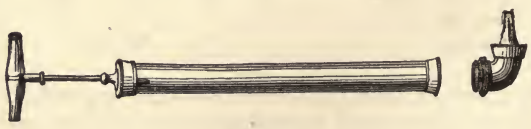

Fig. 148.

the jet represented in the figure is attached; for washing dusty foliage with a soft shower, a rose with many fine holes is screwed

on. The syringe is used for washing, watering, destroying insects, etc.

Garden Engine (Fig. 149). This may be used for all the purposes of a syringe, in washing and watering plants, as well as for washing windows, carriages, and protecting buildings against fire. It will hold about a barrel of water, and is easily moved by its handles on the cast-iron wheels. It will throw water forty feet high.

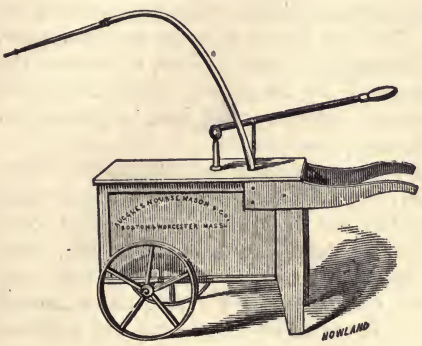

Fig. 149.

Fig. 150.

Net screens are useful in preventing the attack of birds on rare and valuable fruits upon young or dwarf trees. The net should be dipped in tan to prevent mildew when rolled up wet.

Labels for standard trees are useful in retaining the names of the varieties. Purchasers of trees usually neglect the names, and the labels received with the trees being soon lost, nothing more is thought of them till they begin to bear. Curiosity is then excited to know the "new kinds." Conjecture is set on foot, and the greatest confusion follows. Serious and innumerable mistakes are made and perpetuated in this way in all parts of the country.

Permanent labels are therefore important. The simplest is made of a slip of wood, three inches long and half an inch wide, suspended to the branch by a loop of wire; copper-wire is the best, Fig. 150. The name will last three or four years, if written with a pencil on a thin coat of fresh white paint. Better and more durable labels are made of small pieces of sheet-zinc, written upon with a mixture of two parts (by weight) of verdigris, two of sal-ammoniac, one of lamp-black, and thirty of water. The ingredients are to be mixed in a mortar with a small portion of water at first, and the

whole added afterwards. Preserve the mixture in a well corked bottle, shaking it repeatedly at first, and keep the cork downwards to prevent the escape of ammonia, and it will remain fit for use for years.

If the pieces of zinc are suspended by copper-wire, it should be firmly twisted round the zinc so as not to remain loose (Fig. 151), or else the constant motion from wind will soon wear off the wire. The wire should be nearly as large as a small knitting-needle, to prevent cracking off by long use. The loop should be large, and pass round a side-shoot, instead of a main branch, to prevent the danger of cutting in by the growth of the tree; and should be attached below a small fork, to prevent its blowing off the end of the branch.

Fig 151.

The wire may be wholly dispensed with by the following contrivance: cut the zinc into long triangular strips, half an inch wide and from six to ten inches long. Draw the narrow or slender end round the twig, bring it through a hole punched midway between the ends, and clinch or twist it with the fingers or a small pair of pincers (Fig. 152). These labels may be cut and punched by a tinman at a cheap rate.

Fig. 152.

A good, durable, and cheap label, is made of sheet tin. Cut the tin in strips about six inches long, somewhat in the form of a wedge, about a fourth of an inch wide at one end, and three-fourths at the other. Write the name near the wide end, with any sharp steel instrument, as an awl, or end of a file ground sharp, bearing on hard enough to go through the tin coating, so as to reach the iron. In a few months the rain, by penetrating to the iron, will rust it, and make the name quite conspicuous. The label is then attached to the tree by bending the narrow end once about a side limb (Fig. 153). As the tree grows this coil will expand, and not cut the bark. On this

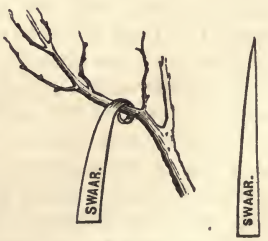

Fig. 153.

account thin tin plate is better than thick. The coil should pass around but once, or it will not give way freely to the increase of growth.

Any tin worker will cut them of scrap or refuse plate for about ten or fifteen cents per hundred.

Lead labels, in the form of those represented in Fig. 150, stamped with type, and suspended with copper wire, well twisted against the hole, to prevent wearing by the motion of the wind, are very durable. Fig. 154 shows the mode of stamping, by sliding the sheet-lead between two plates of iron, A, B, screwed together, and setting the types successively against the upper plate, A, and stamping one at a time. The letters are thus kept in a straight line. The imprinted end of the sheet-lead is then cut off, and forms the label.*

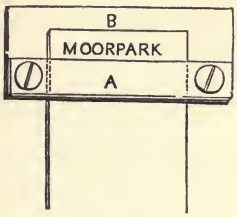

Fig. 154.

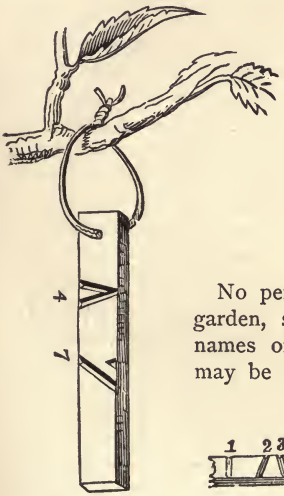

Fig. 156.

No person who plants an orchard or fruit-garden, should depend for distinguishing the names of his trees wholly on labels, which may be lost off. The rows, and the kinds in

Fig. 155.

each row, should be registered in successive order, in a book kept for the purpose. This will facilitate the replacement of any lost label.

Sticks or tallies at the ends of nursery rows, or labels suspended

* It is sometimes a matter of convenience to mark the names on specimens of the fruit itself. This is quickly and permanently done by tracing the name with a blunt stick, or a pencil, pressing hard enough to indent the surface, but not to tear the skin. It succeeds best on pears, the writing soon changing color and becoming conspicuous.

on the successive trees of a row of standards, may be durably numbered on red cedar, after the following manner, to correspond with a written register in a book. Fig. 155 shows the mode of notching with a knife, to indicate the ten figures. To prevent mistakes by getting them inverted, they are always read downwards on a stake, or from the loop of a suspended label. The preceding figure (156) exhibits a label on a tree marked with the number 47.

CHAPTER X.

THINNING, GATHERING, KEEPING, AND MARKETING.

THINNING.

NEXT to good cultivation, nothing contributes more to bring out the excellent qualities of fruit, and to give it size and a handsome appearance, than thinning the young fruit on the tree. If crowded, it is small and often comparatively flavorless. Overbearing always injures the growth of the tree, yet thinning the fruit is scarcely ever practised. The farmer who takes care not to have more than four stalks of corn in a hill, and who would consider it folly to have twenty, never thins any of the twenty peaches on a small shoot. The gardener who would allow twenty cucumber vines in a hill, would be called an ignoramus by his neighbor, who at the same time suffers a dwarf pear to bear five times as many specimens as it could profitably mature.

E. Moody, of Lockport, a successful fruit-marketer, stated before the Fruit-Growers' Society at Rochester, that he had found great profit in thinning the fruit on his peach-trees; that while he had much fewer specimens in consequence of thinning, he had about as many bushels; the larger peaches could be picked in far less time, and while his fine crop sold readily at a dollar and a half per basket, his neighbor who did not practise thinning, found it difficult to sell his for thirty-seven or fifty cents.

President Wilder said, in an address before the American Pomological Society:—"One of the best cultivators in the vicinity of Boston has reduced this theory to practice, with the happiest effect, in the cultivation of the pear. He produces every year superior fruit, which commands the highest price. Some have doubted whether this practice can be made remunerative, except in its application to the finer fruits. But another cultivator, who raises an annual crop of the best apples, assures us that the secret of his success is the thinning of the fruit, and he has no doubt of the economy of the practice."

Apples and pears, when half grown, will show any defects or

injuries from insects In thinning the fruit these defective specimens should, in all cases, be removed. As many bushels of good fruit will be obtained from the trees in autumn, as there would have been of good and bad mixed together, had all been left to grow. The labor of assorting will be lessened, and the fruit bring a higher price in market. An experienced orchardist says that one day's work to fifty barrels of apples will thus take out nearly all the imperfect fruit; while the increased labor of hand-picking so many poor specimens, will be as great as taking them off in summer, when less care will be required with them.

GATHERING.

Mankind consist of two grand divisions—the careless and careful. Each individual may be assigned his place under these two great heads, by observing how he picks or gathers fruit. The careless shake the crop down on the ground, or, if picked by hand, *throw* the specimens into the basket, rather than carry and deposit them carefully. Such persons wonder why they have such poor luck in keeping fruit—it nearly all rots prematurely.

In strong contrast with this treatment is the excellent management of R. L. Pell, of Ulster Co., N. Y., who, by the care he has given, has obtained high prices for his apples in foreign market. His men gather them by means of hooked baskets suspended in the tree; the apples, as gathered, are laid one at a time in the bottom of the basket, and when filled the man comes down and places two at a time in the two-bushel basket. To prevent the possibility of bruising, these are drawn to the fruit-house on a sled by oxen, and two apples only are taken out at a time, till all are carefully deposited on the floor. After being barrelled, they are drawn on a sled to the river, and are carried, not rolled, on board the steamer. When shipped for England, one barrel is hoisted at a time and caught on a man's shoulder at the ship, and carried by two men and deposited in place. When again unloaded the same care is observed, the barrels being carried off on a hand-barrow. Throughout the whole process the same care is observed as in carrying a looking-glass.

Various modes are adopted for hand-picking apples and other fruit. Ladders should always be provided for reaching the different parts of the tree. Step-ladders, five or six feet high, may be used for the lower limbs; longer ladders, resting against the branches, or supported by legs as shown in the chapter on Implements, are employed for higher portions. The remaining scattered fruit may

be collected with a fruit-gatherer attached to the end of a pole. These are all figured and described in the chapter on Implements. Baskets are commonly employed furnished with hooks for suspending to the limbs or rounds of the ladder while filling. In picking, apples should be lifted up to break off the stem, instead of pulling them off, as many of the stems will pull out of the apples, causing decay. They should be laid in the basket (instead of being pitched or dropped in) to avoid bruising. A better way is to buckle a strap passing over the shoulder and beneath the arm, to which the basket may be hooked, leaving both hands free for work. These baskets should be round, so as to be small enough to allow turning for emptying while in the barrel, that the fruit may fall as short a distance as possible. Another mode is to wear a coat, made for the purpose, of strong canvas, furnished with large pockets on both sides, holding a peck or more each. The coat is slipped off and the pockets emptied into large baskets or barrels. A better and more expeditious method, is to take a common clean grain bag and place a stick, sharpened at each end and about a foot long, so as to prop the mouth open, leaving a triangular opening, ready for the reception of apples as fast as picked by both hands. Tie the upper and lower corner together, by placing a pebble in the lower corner, so as to form a knob or button, and then tie the bag strings closely above it. It is then slung over the shoulder, as shown in Fig. 157. A piece of stiff leather buttoned on the shoulder serves to protect it from the weight of the bag. When the bag is filled it is placed in the bottom of the barrel or basket, and emptied by carefully withdrawing the bag and allowing the apples to slide out without danger of bruising. In this respect it is more perfect than a basket, the contents of which must be dropped, unless handed out one by one.

Fig. 157.

The degree of maturity at which fruit should be picked varies with circumstances. Maturity is indicated in apples or pears by the dark brown color of the seeds, but as these cannot be examined, external appearances must serve as a guide. Early apples are best when they have attained full color, and have begun to soften, except such as are liable to become dry or mealy, which should be picked some days before fully ripe. Winter apples should be mature but not ripe. All late winter varieties should be gathered when too hard to yield to the pressure of the thumb, and always before heavy autumn frosts. When a good keeper begins to drop from the tree, as sometimes happens, the crop should be gathered immediately. Windfalls should never be mixed with hand-picked fruit, as they have been bruised by falling, and often heated by the sun's rays so as to diminish their keeping qualities. They should be assorted and reserved for immediate use. Maturity in pears is indicated by a slight change in the color of the skin, and by the readiness with which the stem separates from the tree when the pear is lifted by the hand. There are, however, exceptions to this rule—the Bartlett, for instance, may be picked even before it has attained full size, and, in a week or two, will ripen into a fine, melting texture and excellent flavor. Ripening summer pears in the dark much improves their appearance. A Bartlett, for instance, fully exposed to the sun and allowed to ripen on the tree, or in a well lighted apartment, will show perhaps only a light-brown cheek; but, if in a dark drawer, the light-brown will become a beautiful carmine or crimson. When drawers are not at hand the maturing process may be accomplished on shelves, by first spreading a thick piece of woollen cloth, laying the pears on this, and covering them with the same.

Nearly all pears ripen with a much finer flavor if picked and afterwards matured in the house. The exceptions are very few. Some, which prove only second or third rate when allowed to remain till they soften on the tree, become rich, melting, and delicious if house-ripened. Gathering the fruit while yet hard, will, in nearly all cases, prevent or greatly diminish the *rotting at the core*, which otherwise nearly destroys the value of many early sorts.

Most varieties of winter pears should hang as long on the tree as safety from frost will permit, in order that their fine qualities may be fully perfected. Nothing contributes more to this high quality than keeping the trees in a state of strong, healthy growth, by good cultivation, in connexion with thinning the fruit on the branches. There are a few sorts, as the Lawrence and Winter Nelis, which always, like the Seckel in autumn, possess a good flavor when even of small

size ; but most pears are greatly improved in quality, and all in fine appearance, when grown to a full size.

ASSORTING AND PACKING FOR MARKET.

Assorting, or separating the large from the small, the smooth from the defective, and the hard from the partly ripened, is a practice of great importance, though often neglected. Skilful marketers have learned that apples or pears of two sizes will both bring higher prices when separated, than when left mixed together. Indeed, a few small apples in a barrel have sometimes prevented the sale of the whole. This holds true of all kinds of fruit. For the same reason the most successful strawberry growers are careful to assort the whole crop before placing the fruit in the boxes.

For long keeping, apples and pears should be carefully assorted according to the degree of maturity which they show. Ripe ones soonest decay, and if mixed with hard ones soon spoil the whole. If separated, the frequent picking over is avoided.

Where apples are sold by the quantity, barrels are always best for packing, as well for cheapness and strength as for the ease with which they may be moved without jolting. Apples will keep best if exposed in heaps two or three weeks to open air before barrelling—as some of the exterior moisture escapes, and they become less liable to decay. The few minutes' additional time required to deposit them carefully and without dropping into the barrels, will be many times repaid by the fine condition in which the consumer finds them. There should always be at least two barrels placed side by side when filling ; one should be marked "extra," and as the assorting proceeds should receive none but the finest specimens ; the other only such as are decidedly good ; all the rest, including those that are bruised, scabby, or marked with insects, should be rejected for distant market, and used only for home purposes, such as stewing, converting into cider, or feeding to domestic animals. In well managed orchards, where pruning or thinning the branches, thinning the fruit, and proper cultivation have been attended to, this third or inferior portion will constitute but a very small part ; in other orchards, grown up with suckers, weeds, and grass, and with tops consisting of brush and stunted branches, the labor of selection will be small, for the whole crop will be of this third portion.

Apples should be so snugly placed in the barrels that there can be no rattling when they are moved. They should therefore be slightly shaken several times while filling, A little practice will enable any

one to do this sufficiently without danger of bruising. The upper stratum should be made as straight and uniform as practicable, and at such a height that the head of the barrel will slightly indent them —the dry wood absorbing the moisture and preventing decay.

A simple contrivance is adopted by packers for placing the head in position, and is shown in the annexed sketch (Fig. 158). It consists of a plank, *a*, on which the barrel stands, into one end of which is dovetailed an upright piece of plank, *b*, a little higher than the top of the barrel. A slot, *c*, is cut in its upper end, and a pin runs across to receive the end of the lever, *d*, which may be six or eight feet long. A round board is used as a follower, to be placed upon the head; and across this board is placed a cylindrical piece of wood about three inches in diameter (and flat on the lower side), on which the lever is placed. A moderate pressure at the end of the lever, and a little practice in its use, will enable the operator to bring the head to its position with great ease, precision, and accuracy.

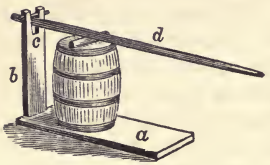

Fig. 158.

Before filling, the barrel should have the hoops firmly driven on the bottom and nailed with shingle nails, then drive on the bulge hoops and secure them with three or four barrel nails in the outside ones. When filled, nail the head firmly. It is a good precaution to nail a small hoop outside each head and within the staves to prevent the bursting out of the heads, which otherwise sometimes happens through careless handling.

Half barrels have been found convenient for packing and keeping winter pears, and for sending them to market, packed as described for apples. Pear-growers who send their crops to distant markets, should pack them early enough to reach their destination before the softening process has commenced. Large losses have sometimes occurred from bruising and other injury when summer or autumn pears have been sent too late.

Apples and pears for shipping have sometimes been packed in charcoal dust, dry sand—and at other times separately wrapped in paper, in the same manner as oranges are shipped—but they can be shipped with as much success without anything with them, if only managed with care in other respects.

In shipping fruit, none but the very best should be sent; all that are small, imperfect, or the least bruised, should be rejected.

Packing Grapes for Market. None but well grown and well

ripened bunches should be taken for this purpose. They should be picked on a dry day, and all imperfect berries removed from the bunch. They should be allowed to dry a few days, which lessens their liability to be broken. After trying many different modes of packing, placing the bunches in pasteboard boxes containing a few pounds each has been found best. No material for packing is put between the bunches nor around them, but care is required to place them so that the boxes shall be compactly filled. These are then put in large wooden boxes for distant conveyance.

Such varieties of the grape as have a tough skin are least injured by long journeys ; while those like the Concord, which are tender, cannot be sent to a distant market without many of the berries being broken open, although this liability is somewhat lessened by drying and slightly wilting for a week or two before packing. The Hartford Prolific is packed in quite small boxes, so that the grapes may be taken from them as required for use, as they will not bear much handling. Most other varieties carry well.

The question is often asked why certain "lucky" vineyard men receive from twenty to forty cents per pound for their entire crop, while others less favored are glad to accept eight, ten, or twelve cents ? The answer must be, in the words of Franklin, " Diligence is the mother of good luck." The most successful grape raisers, after they have selected the best sorts and the best soil, still give assiduous attention to three great points, viz : 1. Good and constant cultivation ; 2. Careful and judicious pruning and thinning out defective fruit ; 3. Careful gathering and the most careful packing. E. M. Bradley, of East Bloomfield, N. Y., a skilful marketer, has kindly furnished the author of this work the following statement of his management :

" Permit me first to say, that the market value of the grape is more dependent upon judicious handling than that of any other fruit with which I am conversant. While the grape is a fruit peculiarly constituted to endure almost an unlimited amount of abuse in handling, no other fruit so richly pays every iota of care that may be expended upon it. The most casual observer of our great fruit markets cannot but have noticed the wide range of prices in all kinds of fruit, produced by a difference in method and style of handling. And no fruit with which I am acquainted suffers more from neglect in growing and marketing, or more amply repays thorough husbandry.

" Thorough pulverization of the soil to a liberal depth *every week* during the *growing season* of the vine, a systematic thinning of fruit, and removing of all superfluous growth, will secure a well matured

crop of grapes. As soon as fully ripe (not before), the fruit should be carefully picked and laid in shallow, well ventilated drawers, carried to the packing-house on a spring wagon, and placed in racks or cribs over registers so constructed as to afford plenty of fresh air, but not exposed to light, or artificial heat. Here the fruit may remain for months in safety, and retain its plumpness and bloom perfectly. When desirable to send to market, the drawers are taken from the rack in the store-room, and placed upon the tables in the packing-rooms, where the fruit is carefully assorted, all green berries and superfluous stems removed, and packed closely in paper pockets or wooden boxes, and immediately shipped. The packing-rooms should be well lighted. Small paper pockets, containing from one to three pounds, snugly packed in wooden cases, two dozen pockets in a case, are found to carry the fruit more safely to market than larger packages. The cases should be as nearly air-tight as possible. I have sent many tons, packed in this manner, to Charleston, S. C., Nashville, Tenn., Quincy, Bloomington, and Dubuque, on the Mississippi River, and many other towns, over equally hazardous routes, with entire safety. Good grapes, neatly packed in fancy paper pockets, will always sell at remunerative prices, however much the market may be '*glutted*' with fruit put up in a slovenly manner.

"In answer to your inquiries, as to size and shape of 'pockets' most desirable, I would suggest as a rule, that the package be made to suit the desired market.

"Fancy fruit retailers, who aim at high prices, require a fancy package, and in the early part of the season a one pound package, gotten up in best style, will command as much money as a four or six pound package of equally good fruit, but less pretentious pocket; whilst the hotel or 'corner grocery' men prefer them (for the table, or to be weighed out by the pound) in wooden cases, containing from twenty-five to thirty pounds each.

"My aim has ever been, in putting grapes into market, to meet the wants of the trade that I endeavored to supply. Boston, for example, will realize an enormous price for first-class fruit in fancy packages, whilst New York would pay far better in wood than in the costly pockets consumed by Boston every-day trade.

"Our one pound pockets are the usual depth (three and a half inches), and about four inches in width, round, and covered with the very best embossed and gilt-figured paper, lined inside with white, and mounted on top with copper tippings and a fancy label printed in colors.

"The two pound boxes (of which I used about 20,000 the past season) are of the same depth, made of the same material, and in the same style as the one pound box. The body and top of the box is pasteboard, with wooden bottom, about one-quarter-inch in thickness, tacked and glued in. The square flat box is out of date, and unsaleable in all our principal markets.

"Our paper pockets are packed in good tight pine cases, two dozen in a case, and make a very safe package for transporting to any desired distance. The wooden cases are furnished with rope handles for convenience of handling, and to prevent baggage-men from turning over or placing on end.

"A tight pocket and a tight case are desirable for transmitting grapes to any distance or to any clime. I commenced shipping to Charleston, S. C., in 1857, in perforated pockets and open crates, thinking they would stand the sea voyage and hot weather better than in close packages, but soon discovered my mistake, and have ever since shipped in close pockets and cases."

Packing Strawberries and other small Fruits. These should be packed in small or shallow boxes, to prevent the injury caused by placing large masses together. Several of these small boxes are placed and secured within one large one. Two modes have been adopted in constructing the small boxes. One is to make them cheap, so that they may be given away with the fruit to the purchaser; the other is to make them firmer and with more finish, to be sent back to the marketer. As the latter kind soon become stained and soiled by repeated use, and much care is required to return them, it is probable that a "gift-box" will be ultimately adopted. Several modes have been already adopted for making them of thin shaved wood, but further experiments are needed to determine the best.

A convenient, light, and cheap set of drawers, or flat boxes, for conveying such firm-fleshed berries as currants, gooseberries, and the more solid strawberries, or for holding the smaller boxes, much used in portions of the West, is constructed in the following manner:

1. Prepare five drawers, each two feet long and twenty inches wide, and two inches deep in the clear. It is best to have them made of pine, three-eighths of an inch thick. It is most convenient to have the stuff all sawed the same width, say two and a half inches wide, and use it this width for the bottom, leaving them about one-sixteenth of an inch apart for ventilation. The front and back sides of each drawer should extend three-quarters of an inch beyond the

ends, as shown in Fig. 159. Next, provide two strips of strong wood (white ash for example) two inches wide and three-quarters of an inch thick. These should be of the same length as the sides of the box, so that when placed lengthwise under the box they may project three-quarters of an inch beyond the ends. Nail these strips so that they shall be lengthwise under the bottom, and three-eighths of an inch from the outer part of the sides. The nails may be driven through the bottom down into the strips. Then nail to the box four similar strips placed vertically, so that their ends shall rest on these projecting pieces, as shown in Fig. 160, and strengthen the connexion by sheet-iron straps passing around the corners.

Fig. 161.

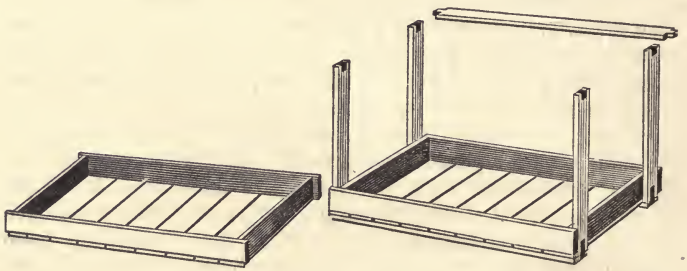

Fig. 159. Fig. 160.

When the boxes are used, the lower one, Fig. 160, is filled with berries; then the next one, Fig. 159, is placed upon it, the projections exactly fitting the posts. This is next filled, and so on, successively, till the five drawers are all filled and in their places within the posts. Cut a board for a lid so as to fit accurately inside of these upright posts, which should be just long enough to project slightly above the lid. There should be open mortices or slots in the top of each post, so as to admit two top pieces, Fig. 161, made the same size as the bottom pieces already described, and with tenons cut on the ends to fit the slots. When these pieces are put in their places and fastened there by means of iron pins through them, or by means of hinged iron straps running over them and keying closely down, the lid will then be held securely to its place, and the whole set of drawers, with its contents, will be ready for railway conveyance. Additional strips extending across the ends from post to post (which may be nailed outside of them) serve as handles and strengthen the whole.

It will be observed that the case, consisting almost entirely of drawers, is light. The arrangement of strips around the drawers, securely fastened at the corners, makes the case strong. Berries can be put into these drawers in bulk, or any of the boxes in use can be placed in them. They are cheap—a good carpenter can make four in a day, complete; the whole cost, made in the best manner, will not exceed $1.50 or $2.00 for a case holding two and a half or three bushels.

Keeping Fruit. The essential requisites for the successful keeping of fruit are—1. A proper degree of maturity; 2. Careful hand-picking to avoid all bruises; 3. Assorting the ripe from the unripe; 4. An apartment with a low temperature and free from superabundant moisture; and 5. A pure air, free from unpleasant odors.

The modes for securing the first three requisites have been already pointed out. An apartment perfectly adapted to the keeping of fruit, having a dry air and low temperature, is of the utmost importance. A warm and moist air will rot the best fruit in a few weeks; while a cool and dry one will preserve it for several months. A warm and dry air will produce shrivelling, especially in pears. One of the most perfect contrivances for keeping fruit is Nyce's Fruit-House, where the temperature is maintained at thirty-four degrees throughout the year, by means of ice placed on an iron floor above, and with the protection of non-conducting walls at the sides. Dryness is secured by sprinkling the floor with chloride of calcium. In this room perishable fruits, which commonly last only a day or two, are preserved sound for weeks together, and autumn pears and grapes remain sound through the winter.*

* These houses are constructed on the following theory:—In the gradual ripening of fruit, hydrogen and carbon are constantly given off; the former uniting with the oxygen of the air, and forming water—the latter, carbonic acid. This process, in any confined vessel filled with fruit, consumes all the oxygen, especially if the fruit be ripe and the air warm, in about forty-eight hours. The rooms of this house are gas-tight, and when filled with fruit, if closed up for two days, a candle goes out in them almost instantly. The fruit is then surrounded by an atmosphere composed of the nitrogen of the air and carbonic acid. Hydrogen and carbon then cease to be evolved from the fruit, and decomposition also, in a great degree, from necessity, ceases. Decay is much retarded by the absence of moisture, which is removed by sprinkling the floor with dry chloride of calcium. More recently the waste "bittern" from salt works, is found to answer equally well and is nearly costless. It has been discovered that a hundred bushels of apples throw off half a gallon of water weekly, which, by the drying powder, is thus withdrawn from the air of the room, this powder being repeatedly dried, as it becomes wet, and used many times. The floor above is of galvanized iron, perfectly water-tight, on which ice is placed, every winter, five or six feet deep. This, by cooling the floor to freezing, keeps the air in the room below at a temperature of thirty-four degrees (or only two degrees above freezing), throughout the whole summer. The walls of the building are double, of iron, three feet apart, and filled with chaff, saw dust, or shav-

The more nearly a fruit-cellar can be made to approach the condition of Nyce's fruit-room, the more perfectly the fruit will be preserved. If a house cellar is employed for this purpose, the fruit-room should be entirely separated from the rest by means of a wall for the purpose of excluding all odors, and for more perfectly controlling the temperature. On this account a cellar under a grain barn commonly succeeds best, the floor above being double with a space of air between. A cellar that is too moist may be rendered dryer by paving with small or broken stone, and covering this pavement with a coating of water-lime cement; and by building a single brick wall within the common cellar walls, with an interposed space of air. Windows hung on hinges on opposite sides and rolling blinds, will assist in maintaining proper ventilation and temperature. A thermometer should be constantly kept in the apartment, which should be at all times near the freezing point if practicable. If the cellar cannot be kept cool enough in autumn, the fruit may be left till cold weather in open barrels, in a dry barn or shed opening to the north.

With a few exceptions, winter pears, if well matured, will keep and ripen in such an apartment without difficulty. There are a few sorts, however, which will require some days, in a warmer room, to finish the ripening process.

Apples may be kept headed in barrels resting on their sides if needed for spring use. If bedded in baked sawdust, or soft chaff (the chaff of timothy is best), moisture will be absorbed, the temperature kept cool and even, and few will decay. Those required for consumption through winter, are kept best upon shelves. The shelves should be in the middle, and a passage extend all around, both for ready access and for ventilation. The shelves may be five feet wide, which will enable the attendant to reach the middle from either side without difficulty. There may be three shelves in an apartment nine feet high, with a space of two and a half feet between each, the lower one being within a foot of the floor. A board five inches high should extend around the edge of each shelf. For keeping pears, these shelves should be furnished with lids or covers to exclude the light; or flat movable boxes with covers may be placed on the shelves for the same purpose. A better and more

ings. Motion is given to the air among the fruit by fans moved by windmills on the roof.

Pears and grapes are kept in this house during the fall and winter months; apples until the months of May and July; lemons, oranges, and pine-apples through the summer season.

compact contrivance for keeping pears is a series of drawers, occupying one or both sides of an apartment. Unless the fruit-cellar is a very dry one, these drawers should be in an unfreezing room above. The size of the fruit-cellar may vary with the amount to be kept. If the shelves are five feet wide, and a passage two and a half feet wide extend around them, a width of ten feet would be required for the whole apartment. The room may be of any desired length. A double series of shelves would require a width of seventeen and a half feet.

The accompanying figure (Fig. 162) represents the plan of a sim-

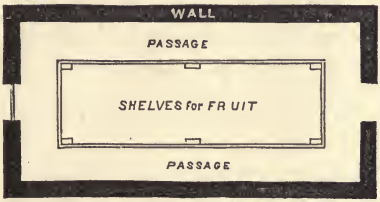

Fig. 162.

ple fruit-room, with shelves, five feet wide in the centre, three in number, one above the other, supported by six posts, with a passage two and a half or three feet wide all around. Fig. 163 represents a

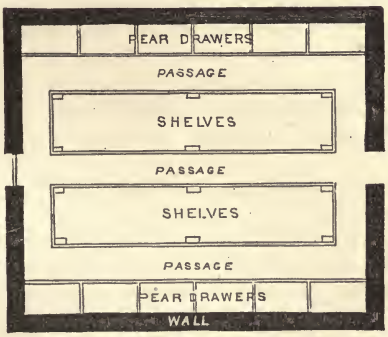

Fig. 163.

larger fruit-room, with two series of shelves, and a row of drawers for pears on each side.

Keeping Grapes. The great leading requisite for keeping grapes

successfully in winter, is to have them *well ripened*, but not over ripe. When grown on crowded, unpruned, uncultivated vines, they will be small, acid, and watery, and will quickly shrivel in a dry atmosphere, and mould and decay in a moist one; and they will soon freeze if the temperature of the air goes much below the freezing point. But well grown and well ripened fruit (resulting from good cultivation and judicious pruning) contains a rich juice, which prevents them from shrivelling or decaying, and freezing, even at low temperature. Various modes are recommended for packing away grapes for winter. They all succeed well, if good, well ripened fruit is taken, as already mentioned, and they are placed in a cool and rather dry apartment where they will not freeze. If packed in boxes, they are less liable to freeze than when exposed. These boxes should not be of pine, as it imparts a resinous flavor. They should, of course, be entirely free from moisture when packed away. As a general rule they are not ripe enough unless the stem which holds them has lost its naturally green color and has assumed something of the color of the grapes—which will be somewhat purple in all dark-colored varieties. One of the best of all keepers among American sorts is the Diana. The Clinton also is an excellent keeper. The Isabella, Catawba, and Rebecca keep well. A successful manager gives the following directions:

"Pick when fully ripe, and on a pleasant day. Let them stand in the grape-house for ten days or two weeks until all moisture is gone, and the stems are perfectly dry. Then pack in a small and shallow box about fourteen by ten and four inches deep, after cutting out all imperfect berries. Pack close and tight, and in the manner that the Hammondsport or Ohio grapes are sent to market, and nail up the boxes. Use no paper whatever. I have Isabellas to-day (March 7th) in fine order, packed this way. They must be kept in a cool and dry place."

H. G. Warner, of Rochester, who has kept grapes nearly into midsummer, lays down four essential requisites. They must be *ripe, clean, dry, and cold.* They are packed in boxes containing five, twelve, and twenty-four pounds. They are placed in a cellar under his barn, where the temperature is often twenty-eight degrees through winter. Grapes will not freeze at this temperature when kept in boxes. He is careful not to place so many in each as to press upon or crush the lower ones. The boxes are nailed up and set one upon another, so as to occupy little room.

PRESERVING FRUIT BY ARTIFICIAL MEANS.

There are several modes of preserving fruit beyond the ordinary season of its ripening. The simplest is to select long keeping varieties, merely placing them away in a cool, dry apartment, on shelves, in boxes or drawers, or in tight barrels. This course, variously modified, is pursued with apples, winter pears, and grapes. Another way is the old fashioned, now nearly discarded, mode of preserving in sugar, pound for pound. Another, and in some respects the best mode, is drying the fruit; if rich, high flavored sorts are selected, and the drying rapidly performed, in well ventilated rooms, the result is excellent; but poor fruit, half decayed in the process, never repays the trouble. The fourth mode—that which claims our particular attention at the present moment—is preserving in air-tight cans or jars. For this purpose but little sugar is needed, or no more than to impart an agreeable flavor.

There are many modifications of the process. The long and minute directions sometimes given, without pointing out the main and essential requisites, have rather served to bewilder than assist the beginner. All that is absolutely necessary is to select good fruit, to heat or cook it, and inclose it in air-tight cases, without any air bubbles or interstices. If kept in a cool place, it will remain for months without injury.

PARTICULAR DIRECTIONS.

Quality of Fruit. It is important that the fruit be well grown and well ripened, as it then contains more and richer juice for preservation. Small, half green, imperfect, or half decayed specimens, should be rejected.

Jars or Cans. Glass jars are now generally employed—earthen succeeds equally well, and is somewhat cheaper, but the fruit cannot be seen. A large number of patent covers have been invented, possessing various degrees of merit. They may be divided into three classes—those consisting of cork; those made of metal or glass, with cement lining; and those with India-rubber lining. The objection to cork is its porosity, requiring a large amount of cement, through which the air pressing is apt to impart its flavor to the fruit. The India-rubber linings are the most convenient and easily applied, but they should be well made, and form a perfect fit; many that have been offered in market, not being tight, have caused the

spoiling of the fruit. Different modes are employed to remove the covers in taking out the fruit. The corks should have two small and strong cords placed under them, for lifting them out, the ends of which should be well covered with cement, to prevent the admission of air, or a round piece of cotton cloth may be used for the same purpose. Pincers may be used for drawing the cord or cloth in taking the covers off. The covers may be loosened with the India-rubber lining, by inserting the point of a knife.

The annexed figures represent one of the simplest modes of applying the India-rubber lining. A ring of this material, about a quarter of an inch wide, and one-eighth of an inch thick, is placed in a groove or depression outside the neck, as shown in Fig. 164. A

Fig. 164.—*Top of Jar, with India-rubber band; place of tin cap shown by dotted line.*

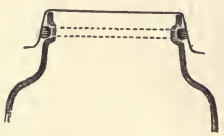

Fig. 165.—*Section of top of Jar, with India-rubber band; place of India-rubber shown by dotted line.*

tin cap is then applied, which fits closely, and presses against the outside of the band. The upper edge of the jar is ground, so that the tin cover rests flat upon it. Fig. 165 is a section of this arrangement.

Heating the Fruit. The fruit should be heated to nearly or about the boiling point of water, but should not be made to stew or boil, as this would break the form of each specimen, and reduce the whole to a mass. For common family purposes, the best way is to place the fruit in a tin pan, with about as much sugar as will give it a proper flavor, and then set the pan in the top of a stove boiler, where it will fit as a lid; then let the water boil beneath the fruit until the whole is well heated through. Small fruits require less time than large ones. About fifteen minutes will be needed for strawberries and raspberries; twenty minutes for cherries, currants, peaches, and plums, and half an hour for apples, pears, and quinces.

Filling Jars. While the heating of the fruit is going on, place three or more empty jars in another boiler, and pour in cold or moderately warm water till it rises nearly to their necks. A heavy weight, as bricks, flat irons, or flat stones, must be placed on these jars, to hold them down; and it is safest to place a few small strips

of wood on the bottom of the boiler, before setting the jars in, to prevent their cracking by the heat below. When the water about the jars has nearly reached boiling, they then may be filled with the fruit by means of a dipper. This work is facilitated by providing a wide tin funnel (Fig. 166), made on purpose to fit the mouth of the jar, and it should have a handle a foot long, to prevent any danger of burning or scalding the hand. When the jars are full, the contents should be slightly shaken, to start up any air bubbles that may remain, and the water allowed to boil slightly about them for a few minutes. The covers should be then applied, and made air-tight, at the same moment the jars are withdrawn from the water. Before applying the cover, the jars should be so completely filled with fruit, that not the least air or space may remain, but the whole be perfectly solid.

To save the hands from scalding, there should be a pair of forceps (Fig. 167) made to fit the neck of each jar, to grasp it readily in lifting it from the hot water.

The juice of all small fruits furnishes sufficient syrup with the

Fig. 166.—*Funnel for filling Fruit Jars, with a rim set on below, to fit the outside of the neck.*

Fig. 167.—*Forceps for lifting Jars from hot water.*

sugar to fill all the interstices; but some larger and drier sorts require sometimes the addition of a portion of syrup made by boiling a pound or two of sugar in a quart of water.

Some persons, after having heated the jars, fill them while they are standing on a table, and then replace them, and continue the boiling for a few minutes, or until every air bubble has passed from them, before sealing them tight. Either way will answer, if the work is well done.

Cement. The best is made of one part of tallow mixed with about ten or twelve parts of rosin. An increase of the tallow softens the cement. The most perfect India-rubber linings obviously need no cement; with corks it must be used freely, and is indispensable. The best mode is the following, described in the *American Agriculturist:*

Small tin saucers, or "patty-pans," are procured, an inch more in diameter than the mouth of the jar—these may be obtained cheaply, by the quantity, of any tinman. See Fig. 168.

Fig. 168.—*Tin Saucer for covering top of Jar.*

When the jar is filled with fruit, the cork is crowded snugly in, and a coating of cement is placed on the top. A portion of the melted cement is then poured into one of the tin saucers, and the mouth of the jar inverted, placed in it—forming, as soon as cool, a perfect air-tight cover, the saucer remaining until the fruit is taken out of the jars. Common tea saucers, and even blacking boxes may be used, instead of tin saucers.

Quantity of Sugar required. Some have stated that they succeed in keeping the fruit without using any sugar; but in ordinary practice it is safer to apply it, and it is best to do so at once, rather than to defer it till the fruit is used. Strawberries, peaches, pine-apples, and quinces, require but a small quantity, five ounces to a quart of fruit being sufficient. Cherries, plums, raspberries, and blackberries, require more, or from seven to eight ounces.

Fig. 169.—*Fruit Jar, filled and covered with Saucer.*

Stone Jars. In the absence of common jars, which could not be procured, a friend employed two gallon stone jars, with entire success. They were filled as already described, the fruit running out all around as the lid was applied, so as to prevent any vacancy or air, and the whole well cemented. After several months, they were opened in perfect condition.

Tomatoes. These are the easiest preserved of all ripe fruits. They may be kept entire after merely removing the skin; or, what perhaps is better, as well as more economical, stewed down to about one-half of their original bulk, as they are a very watery fruit.

Strawberries need but few minutes cooking; cherries a greater length of time; peaches still longer, and should be well done.

In order to determine whether the fruit has been well put up, when India-rubber lining is used, lift them by the covers, or apply a few pounds' force to them. If the cover comes off, the work has not been well done—some air has been allowed to remain, or the heating has been insufficient, in which case the boiling must be done over again. It is safest to examine them a second time, in about a week.

It is important that the jars, after the whole process is completed,

be placed in a cool and rather dry place. If the temperature is warm, they may spoil by fermentation; and experience has fully proved that they mould in a damp cellar. If the temperature were but a few degrees above freezing, they would probably keep uninjured for years. There is no doubt that the apartment should sometimes have the credit which is ascribed to a particular mode of putting up.

Glass jars should be kept in a dark place, to exclude light.

DRYING FRUIT.

Drying fruit has several advantages over canning or bottling. It is cheaper; it may be adopted on an extensive scale; the fruit may be kept with less care; and being several times lighter than when fresh, may be sent long distances, or to foreign countries, at a moderate cost. When fruit-growers shall learn that dried fruit from the highest flavored sorts is as much better than that from the poor unsaleable varieties so often used for this purpose, as the best fresh fruit of the one sort exceeds the other, purchasers will also be willing to pay a much higher price for the best article. When, superadded to this, the fruit is dried rapidly so as to retain a clear, light color, and a perfect flavor, instead of the dark, half fermented fruit resulting from slow drying in bad weather, there will be no difficulty in finding a ready sale for all that may be offered in market. When abundant seasons occur, the surplus should be saved by drying, and may be kept another year.

In some parts of the Western States, houses are erected for drying fruit, and are warmed by fire heat, by means of a furnace with a flue extending around the building, similar to that formerly used for green-houses. This flue is covered with sheet iron. An ample ventilator is placed at the top for the free escape of the large volumes of watery vapor which rise from the drying fruit. Trays or hurdles, about two feet wide, six feet long, and three inches deep, with small strips or laths forming the bottom, are placed in three tiers, one above the other, with a foot or more of space between them. Long strips of scantling, laid horizontally, extending the whole length of the house, and six or eight feet outside, form a sort of railway track on which a frame with rollers runs in and out through a wide door, for running in the fresh fruit and bringing out the dried. A house, ten by fourteen feet, and eight feet high, has been found sufficient for about two barrels of fruit at a time, and about twenty-four hours complete the drying process.

Fig. 170 represents a small, portable, fruit-drying house, capable of being carried to the orchard, and used on the ground. It consists of a small building from two and a half to four feet square, or of any other convenient dimensions, the lower part covered with sheet iron

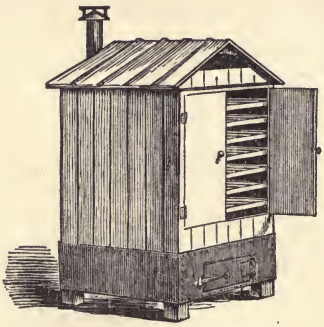

Fig. 170.

to prevent danger from fire, and containing a small stove, extending through the house, from the rear of which passes the stove-pipe on the outside, the upper portion of which is seen in the figure. The fuel would be more completely economized by bringing the pipe back again, and passing it up on the same side as the door of the stove, reversing the place of the doors for introducing the shelves.

CHAPTER XI.

FRUITS TO SUPPLY A FAMILY.

THE question is often asked, "What shall I plant in order to obtain a full supply of fresh fruit for a family the year round?" It is difficult to give a precise list, as in some seasons the crop may be many times greater than in others; and again, some will bear abundantly and others fail in the same season. The following, however, will serve as an approximation:

The earliest fruits, about the first of summer, will be strawberries. A selection of the most productive sorts, well cultivated, with the runners kept cut off, will afford about one quart a day from each square rod for a month. Three or four square rods will, therefore, give an abundant supply for a family. Four or five hundred plants will be sufficient for this extent of ground. These will be followed by the earliest cherries, and by currants, raspberries, and gooseberries. Two dozen bushes of each of the four best sorts of currants, the same number of raspberries, and two dozen of Houghton's gooseberry, will, if well cultivated, furnish an abundant supply. One dozen cherry trees will be enough. Two or three dozen bushes of the blackberry will supply a quart or two a day for some weeks towards the close of summer. Apricots, early apples, and early pears, and a few of the earliest plums, will commence the season of abundance which, with the later varieties of these fruits, will last till near winter. Winter apples and pears, and all the good-keeping varieties of the grape, will continue the supply until spring. Long-keeping apples, such as the Northern Spy, Roxbury Russet, and other sorts, if placed in a good, cool fruit room or cellar, will continue until the commencement of the new supply of strawberries.

To obtain this supply there may be half-a-dozen apricot-trees, a dozen or two of plums, two dozen of summer and autumn pears, and as many more of winter varieties, the same number of summer and autumn apples, and from fifty to one hundred trees of winter apples. A dozen or more of peach-trees and the same number of well man-

aged grape-vines will contribute materially to the variety and excellence of the supply. The fourth of an acre of well cultivated vineyard will be sufficient to furnish several pounds of fresh grapes daily through the autumn and winter months.

The extent of ground required will be about ten or twelve square rods for the different summer fruits, and an acre and a half or two acres more for all the others except the winter apples. A plantation of dwarf apples and dwarf pears will enable the owner to reduce considerably this extent of ground.

PLAN OF A FRUIT GARDEN.

The accompanying plan of an *acre fruit garden* shows the number and disposition of the trees of each kind. It is represented as a *square*, but may be varied in form to an oblong shape, planting about the same number of trees in fewer or more rows, as the case may be. It is so arranged that although the trees are of different sizes and at different distances, the rows run both ways, and admit readily of horse-cultivation. The plums are placed in a row at one side, in order that pigs and poultry may be confined exclusively among them during the season of the curculio, which proves one of the most efficient means for its destruction; and in connection with knocking on sheets, will afford good crops under any circumstances, if fully and efficiently applied. A movable or hurdle-fence, separating the plums from the rest of the trees, renders the remedy many times more efficient than if these animals were allowed the whole range of the fruit garden. In some places, where the curculio is particularly destructive, cherries and early apples are also attacked; in which case, as these fruits are next to the plum row, all may be included in the pig-yard, if desired.

Autumn and winter apples are not required in an enclosure of this kind, and the early sorts are placed here only to protect them from being stolen, besides the reason last named.

Pears may be planted with standards and dwarfs together in the same row, the dwarfs bearing and flourishing while the others are coming forward; or they may be placed in separate rows. The peaches, if in rows twenty feet apart, and twelve and a half feet in the row, will have quite enough room at any age, provided the long limbs are *thinned-in* from the outside every two or three years. With this care, apples may be planted much nearer than usual. None of the trees stand on exact squares; the importance of preserving straight rows for cultivation being greater than the form of

the space occupied by each tree. When rows are wide apart, less room is needed between the trees in the rows.

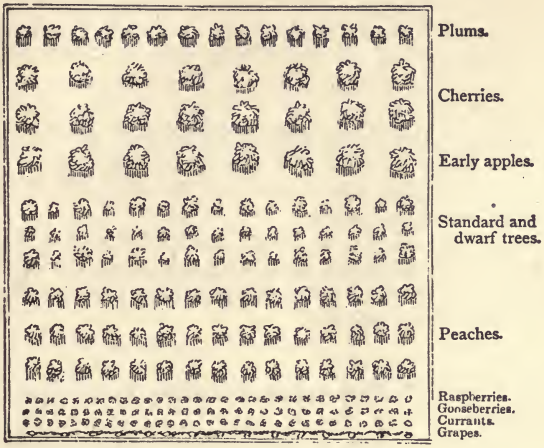

Fig. 171.—*Plan of Fruit Garden.*

By the arrangement we have here planned, the following trees may be planted on an acre, namely:

15 plum trees,	1 row,	occupying	20 ft.	—	13 ft.	in the row.	
16 cherry trees,	2	"	"	40	"	26	"	"
8 early apples,	1	"	"	25	"	26	"	"
16 standard pears,	3	"	"	40	"	26	"	"
29 dwarf do.						13	"	"
48 peach trees,	3	"	"	60	"	13	"	"
45 raspberry,	1	"	"	4	"	4	"	"
45 gooseberry,	1	"	"	4	"	4	"	"
45 currant,	1	"	"	4	"	4	"	"
10 native grapes,	1	"	"	12	"	20	"	"

In all 132 trees, besides the raspberries, currants, gooseberries, and grapes.

As every cultivator would make a different selection, and as we have elsewhere given carefully made lists, it is hardly necessary to occupy space at present on this subject, except to remark that varieties *ripening in succession* should be sought, when a family supply is the object.

It may occur to some as an objection, that too much space is given to cherry trees. There will be. however. a decided advantage from the abundance of light and air for the trees, in diminishing the tendency to *rot* in the fruit, one of the most serious drawbacks in cherry culture. More room is given to dwarf pears than usual, on account of their proximity to the standards.

All kinds of trees may be made to conform in some degree to the room allotted to them, by thinning in the exterior occasionally.

It may be stated that each side of a square acre is about 209 feet, and that the preceding measurements of distances will all come out in accordance with the plan.

There are many who would like a larger fruit garden. The following numbers and distances are accordingly given, the mode of arrangement being the same as in the preceding plan—each side of the two-acre lot being 295 feet.

40 plums, nectarines, and apricots,	2	rows,	occupying	40	ft.—	15	ft.	in row.
40 cherries,	2	"	"	50	"	15	"	"
10 early apples,	1	"	"	30	"	30	"	"
40 standard pears,	2	"	"	40	"	15	"	"
80 dwarf do.	2	"	"	20	"	7½	"	"
80 peaches,	4	"	"	80	"	15	"	"
72 raspberries, 72 currants, 72 gooseberries,	3	"	"	12	"	4	"	"
10 native grapes,	1	"	"	10	"	20	"	"

Strawberry-bed, 13 feet wide, 295 feet long.

The grapes are near the wall or fence, and, having the strawberry-bed and small bushes in front, are not shaded.

A fruit garden of this size furnishes 290 trees, ten grape-vines on a trellis, and 216 raspberry, currant, and gooseberry bushes, with ample space for a strawberry-bed, a portion of which should be prepared each year for planting anew, say four feet wide, which will leave eight feet for bearing beds, and give new plantations every third year.

The cost of preparing and cultivating an acre of land, as we have proposed, will be almost incomparably less than where all is done by hand. The following will approach a correct estimate where the soil requires enriching as well as underdraining:

Underdraining an acre of land, at intervals two rods apart,	$25 00
Subsoiling twice, trench ploughing four times, and harrowing twenty-five times,	22 00
100 loads of manure and drawing, say,	50 00
	$97 00

This expenditure will probably be returned, on an average, at least every year, in the increased value of the crop, after the first five years of growth.

The annual expense of cultivating such a fruit garden would be about as follows :

Ploughing once in spring, to break up the settled earth,	$2 00
Cultivating with horse, or harrowing six times,	3 00
Whole annual cost,	$5 00

HOW TO OBTAIN FRUIT FOR NEW PLACES.

This is an inquiry that often occurs in the minds of many owners of new places, or who have built new houses on unimproved spots. We can inform such residents that much may be done towards an immediate supply with proper selection and management, and that the assertion which they often hear, that "it will take a lifetime to get fruit" from a new plantation, is an absurd error.

The quickest return is from planting *Strawberries.* If set out early in spring, they will bear a moderate crop the same season. We have repeatedly obtained fine ripe berries seven weeks from the day they were set out. The second year, if the bed is kept clean, the product will be abundant. Wilson's Albany will safely yield any year a bushel from a square rod, or about two quarts a day for half a month.

Muskmelons and *Watermelons* will yield their delicious products four months after planting.

Gooseberries, *Currants*, *Raspberries*, and *Blackberries*, all bear at about the same period from the time of setting out. Good-sized gooseberry plants, say a foot and a half high, will give a good crop for bushes of their size, the second year. We have had a bushel of Cherry currants the third summer after setting out quite small plants, from a row thirty feet long. A bush of Brinckle's Orange raspberry has been known repeatedly to bear about a hundred berries the same year that it was transplanted—the fruit, however, was not full size.

Dwarf Pears of the right sorts, and under right management, come quickly into bearing. The most prolific sorts give some returns the second year, and more afterwards. Among the dwarf pears which bear soon, are Louise Bonne of Jersey, Doyenne d'Eté, White Doyenne, Giffard, Fontenay, Jalousie, Josephine de Malines, etc. The following sorts bear nearly as early on pear stock, viz. Bartlett, Seckel, Winter Nelis, Washington, Onondaga, Howell, Passe Colmer, Julienne.

Grapes afford fruit soon—usually beginning to bear the second and third year. The Isabella, York Madeira, Diana, and Delaware, are particularly recommended for this purpose at the north, and the Catawba may be added for the Middle States, wherever it does not rot.

Dwarf Apples should not be entirely overlooked in the list of early bearers. Half a peck per tree is often obtained the third year from the most productive sorts.

A good supply of all the preceding will be sufficient to furnish a family with these wholesome luxuries from within a year or two of occupying entirely new premises; and will not only add greatly to the comforts and attractions of home, but contribute materially to the uniform health of the occupants.*

* Fruit *vs.* Malaria.—*Residents* in the Western States, and other regions where intermittents and similar diseases result from malaria, state that a regular supply of ripe, home-grown fruit, is almost a sure preventive. Eat the fruit only when fully ripe, and eat only moderate quantities at a time, and little need be feared. The residents of such regions should, therefore, not omit the earliest opportunity for a supply. Plant large quantities of strawberries for early summer—they will bear abundantly a year from the time they become established. Plant many currant bushes—for these are a most healthy and excellent fruit—very hardy—and if in abundance, will last through all the hottest parts of the summer. The Doolittle and Orange raspberries are profuse bearers—the former very hardy, the latter generally so, but should be laid down and covered with an inch or two of earth for winter. The Rochelle blackberry, if pinched in when three or four feet high (about midsummer,) will bear abundantly, and prove hardier than if the canes run up without control. The Delaware, Clinton, and Concord grapes, are early and hardy, and will bear in two or three years from transplanting. Dwarf apples, on the Paradise and Doucin stock, will flourish in any locality, and begin to bear profusely in three or four years, and on the Paradise stock often in two years. Some varieties bear early on common stock; such, for example, as the Dyer, Lowell, Early Strawberry, Sops of Wine, Oldenburgh, Porter, Belmont, Jonathan, etc.; but these will, of course, bear much sooner as dwarfs. The Bartlett, Washington, Julienne, Flemish Beauty, Beurré d'Amalis, Onondaga, Howell, and Seckel pears, produce early as standards, and the Louise Bonne of Jersey as a dwarf. Houghton's gooseberry grows with great vigor, is very hardy, and in two or three years affords almost solid masses of berries on the branches. Such fruits as the above should be planted out on every new place, as indispensable to health as well as to comfort and economy; and emigrants to new countries should take a supply with them, as the best medicine chest they can provide.

CHAPTER XII.

MANAGEMENT OF NURSERIES.

It is impossible in a work like this to give full directions for the raising and management of young trees in the nursery. Every one who buys trees should know when they have been properly cultivated; and as some planters prefer to raise their own trees, a few leading directions will be laid down for the guidance and assistance of such as wish to become more fully acquainted with nursery management.

Soils. The first great requisite is the selection of a suitable soil. More depends upon such selection than at first glance would seem possible. At least ten thousand good trees may be raised on an acre—worth, at twenty cents each, two thousand dollars. If the soil is perfect in every respect, and the other requisites of good stocks, transplanting, and cultivation, are attended to, there will be no difficulty in raising this amount. But if the soil be wet or sterile, or otherwise unsuited to the purpose, none of the trees can be good; one-half or nine-tenths may be stunted, crooked, and unsaleable; the rest will perhaps not sell at half price. While, therefore, a poor soil should not be accepted on any terms, it would be better to pay a hundred dollars yearly rent, if necessary, to secure one in perfect condition. A light or sandy soil will raise peach and cherry trees and often apples, and it may be worked with great ease and in all kinds of weather; but for standard pears and plums a stronger or more clayey soil is absolutely essential, and if properly underdrained, is often as good for all other trees. Every complete nursery, therefore, should either consist wholly, or in part, of a strong loam or loamy clay, which in general will require previous thorough tile draining. The necessary fertility given to such a soil will be retained several times longer than by light gravel or sand.

Nothing is commonly better than old pasture for the commencement of a nursery. It should be ploughed twice or more until made

perfectly mellow, which should be done the previous autumn if for planting in the spring. Or if turned over in the spring with the largest double Michigan plough to a depth of a foot or more, by means of three yoke of oxen, it will generally be found in a fine condition.

If the soil is not rich enough without manuring, it is better to apply the manure a year or two beforehand to other crops, or else to apply old rotted or composted manure. An application of wood-ashes at the rate of forty or fifty bushels per acre, if fresh, or a hundred or two, if leached, is often useful and sometimes eminently so. These ashes are well applied if mixed with the compost at the rate of one-tenth or one-twentieth of its bulk.

Laying Out. Nurseries should be laid out so as to admit of horse cultivation. For this purpose strips of land twelve feet wide should be left on opposite sides of the nursery, at the ends of the rows, for the horse to turn about upon. Cross alleys should be left at convenient distances for carting out the trees and for the registry of the different kinds in the rows. The length of the rows between these alleys will depend somewhat upon the size of the nursery, varying from one hundred to three hundred feet.

Shelter. In selecting a site for a nursery, the sweep of prevailing winds should be avoided; as in very windy places the young shoots from buds and grafts are apt to be blown or broken off, and the young trees bent or inclined. If necessary, belts or screens of evergreens may afford shelter from strong winds, not being placed, however, near enough to shade the trees, nor to injure their growth by the extension of their roots. On the other hand, low and sheltered valleys, being more liable to sharp night frosts, are objectionable for the site of a nursery.

Fences and other barriers which cause large snow-drifts and a consequent breaking down of the young trees, should be avoided as much as practicable.

Seeds and Stocks. The successful growth of the young nursery trees depends essentially on good, vigorous, and healthy stocks. Seeds from healthy and vigorous trees should, therefore, be always selected. It is common, in raising apple-seedlings, to procure pomace from cider-mills; wash out the seeds and plant promiscuously. If the strongest seedlings only, thus obtained, are selected for setting out, good trees would be the result; but it would be better to obtain apples for this purpose from trees of known hardiness and fine growth. The same remarks will apply to the selection of pear-seed and cherry, plum, and peach stones.

Different modes are adopted for obtaining apple-seeds easily from the pomace. The following is similar to that used by most nurserymen. Make a box five feet wide, eight or nine feet long, and ten inches deep; leave the lower end, *f*, one inch lower than the sides, for the water to flow over. Place this box in the bed of a brook or stream, on crossbars or scantling, with a dam above to collect the water into a trough, carrying the water into the box, and projecting six inches over it. This trough should be made of boards twelve inches wide nailed together, and the stream should be large enough to nearly fill it when flowing gently. To prevent the water

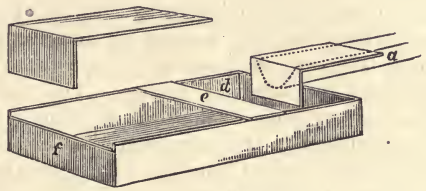

Fig. 172.—*Apple-seed washer.*

from dashing into the box too furiously, two boards are first nailed together as shown at *b*, one board being eighteen inches by two feet, and the other eighteen inches by one foot. The longer board is placed on the top of the spout, and the shorter at right angles across the lower end of the spout. This serves to throw the water perpendicularly downwards into the box, and at the same time serves to spread it out into a thin sheet. By moving this board up or down the spout, the quantity of water pouring into the box may be easily controlled.

One man stands on the board *e*, which extends across the box; and the other carries and deposits the pomace (well pounded to pieces) into the box at *d*, one or two bushels at a time. The man on the box then stirs the pomace rapidly with a four-tined fork, and throws out the straws. The pomace floats over the lower end (which is an inch lower than the sides), and the seeds fall to the bottom. A few back-strokes from the lower end of the box assist in the separation of the remaining pomace. In washing a "cheese" that contains a bushel of seed, it is usual to wash it two or three times, by using a scoop-shovel. Afterwards, the last cleaning process is given to it by placing the whole in a box, and then scratching a four-tined fork through it a few times. A little experience will

enable any one to judge accurately of the proper quantity of water to turn on, so as to make rapid work, and not carry the seed over the box.

The pomace, *fresh* from the cheese, should be drawn and placed on a board platform beside the box, and then plenty of water thrown upon it, until it is thoroughly soaked. This will render it easily beaten to pieces with a hoe. The pomace should never remain in the cheese over twenty-four hours, as it soon ferments and the seed is spoiled.

The best stocks for raising standard cherries suited to the eastern portions of the Middle States, are procured from the Black Mazzard, which is the original type of the heart varieties. The fruit is to be collected when fully ripe by shaking or beating off on sheets placed below—the pulp washed off and the stones mixed with alternating layers of sand, and kept exposed to freezing and thawing until early the following spring. They are then to be planted out in nursery beds or thick rows. The spring following they may be transplanted to the permanent rows of the nursery. If the stones, after being washed from the pulp, are to be carried to a distance, they should be dried in the shade for a few days to prevent moulding. But the drying process should not be continued, as a few weeks' exposure to air will lessen or destroy their power of vegetating. Plum and peach stones may be similarly treated; but peach-stones do not as soon become injured by exposure to air as those of the smaller fruits. Plum and cherry stones keep well through winter, after being mixed with sand, by placing them in shallow pits only a few inches deep, and covering them with flat stones. They start very early in spring, and should be planted the moment the frost is out of the ground.

For dwarf cherries the seeds of the Mahaleb are used, and are treated precisely as those of the Black Mazzard already described. In the Western States the Mahaleb succeeds better as a stock than the Mazzard; and the Morello stock, which is still hardier, answers the purpose well where the others fail, although the heart varieties, when budded into it, do not take readily unless these stocks are in the most thrifty condition.

Dwarf apple-trees are obtained by budding the common varieties on the Paradise or Doucin stock. The small Paradise apple, which grows but little larger than a currant-bush, reduces the size of the apple-tree worked upon it so as not to grow more than six or eight feet high, and to bear in two or three years. The Doucin stock is larger, and forms an apple-tree intermediate between the dwarf and

the common standard. Both of these stocks are raised by layers or stools, and are commonly imported from Europe by nursery-men.

The French quince, which is employed as a stock for working such varieties of the pear as succeed well upon it to form dwarfs, is obtained by stools, layers, and cuttings. When cuttings are planted they should be made in autumn, about ten inches or a foot long, and either planted out the same autumn or very early the following spring. They should be set in a compact soil, the earth closely pressed about them—the tips projecting an inch or two above the surface. They generally fail in a light or gravelly soil. If set out either in autumn or spring they should be covered with an inch or two of fine fresh manure. This protects them from the cold through winter, and preserves the moisture of the ground in hot weather. Many of them will take root and grow, and should be taken up in the following autumn, and heeled in and covered, ready for setting out in the nursery rows in spring.

Planting Seeds. Seeds are usually planted in thick seed-beds for the first year—especially those of the apple, pear, plum, and cherry. The ground should be rich, mellow, and in perfect condition. As a general rule, the depth should be from three to five times the length of the seed—heavy soils requiring less depth than light ones. If there is much clay the surface should receive a sprinkling about half an inch thick of fine manure to prevent the formation of a crust. The seedlings should not be so thick as to retard each other's growth. The ground should be kept constantly mellowed throughout the summer to promote as free a growth as possible. The seedlings should be taken up in autumn, and either heeled in or packed in boxes with fine compact moss. Before setting out they should be carefully assorted, so that a uniform size may be in each row and no irregularities or gaps occur. Before setting out, the tap-roots should be shortened and the tops reduced. All imperfect or doubtful plants should be rejected, in order to save the useless labor of transplanting those which will not grow or take the bud.

Seedlings which have a single slender root, as the apple, may be transplanted expeditiously with a dibble, which may be easily made of an old spade-handle shod with sharp iron as in the annexed cut, Fig. 173. The soil being previously deep and mellow, this instrument is thrust down by the side of the stretched line, finishing the hole by a few slight lateral motions of the hand, then thrusting in the seedling held in the left hand and pressing the earth very compactly about it with the same tool. Great

Fig. 173.

care is to be taken that the hole be entirely and closely filled, and that no cavities are left among the roots below. If the weather be dry, it will be well to immerse the roots previously in mud; and in any case but few plants should be left exposed to the air at a time.

If the seedlings be valuable, as those of the pear, or have broad branching roots like the French Quince, they should be set out with a spade—a trench being previously cut by the line for this purpose, or a straight furrow made by a skilful ploughman before the line is stretched. One man holds each successive seedling by the hand, placing it close to the line, while the other covers the roots with a spade, moving backwards in the row.

Seedlings may be set out in the nursery row in autumn if perfectly hardy and the soil is not subject to heaving by frost; but, as a general rule, it is safer to do all the transplanting in spring. Pear stocks should be set out very early in the spring, to prevent check in their growth, and to admit of budding the same season.

The age for setting out seedlings must depend on circumstances. Yearlings, if strong and vigorous, are always the best, and it is extremely desirable that they grow with sufficient vigor to be budded the same season. If the budding has to be deferred, a whole year of time, cultivation, and care, is lost—more than enough to overbalance the additional cost of the best stocks.

Cultivation. The soil in the nursery should be kept perfectly clear of weeds and in a state of constant cultivation—especially during the early growth of the seedlings and young trees. Hand-hoeing is expensive, and is only needed for the extirpation of weeds, and occasionally, when performed with a pronged-hoe, for loosening the clayey soil between the trees. The horse should be kept constantly going, either with the plough or cultivator. Careful hands should be employed for this purpose, who can run closely to the rows without injuring the trees. Short whiffle-trees should be used with the strap-traces passing round the ends as figured in a previous chapter. If the plough is used it should run shallow when near the rows. It is a useful implement for turning the soil away from trees before hoeing out weeds; and it may be also used for throwing a slight covering of mellow soil against them to cover up weeds as they are just appearing at the surface.

Budding and Grafting. Root-grafting is extensively practised by nurserymen for the apple. The mode of its performance is described in the chapter on the apple. In setting out the root grafts great care should be taken to pack the earth closely around them. Leaving cavities below, which is not unfrequently done by

careless workmen, is sure to result in their failure. Root-grafting the pear only succeeds when strong seedlings, with well branched roots, are taken, and the whole plant used, inserting the graft at the collar and wrapping with muslin plasters.

Nearly all other stocks are budded. The time for budding varies much with the kind of tree, and with its condition. To prove successful, it must be done when the bark of the stock lifts freely from the wood, and also when the inserted buds have been sufficiently matured. The cherry, in general, requires budding on the mazzard stock, about midsummer; but sometimes the growth of the stock continues so late that it may be done near the close. The Mahaleb continues to grow later, and the budding may be correspondingly deferred. On the common stock the plum requires early budding; the wild or Canada plum, used for dwarfing, continues to grow much later. The operation may be performed on the apple at any time between the maturity of the inserted buds and the decrease in the growth of the stocks. The same remark will apply to the pear on pear stocks; as the latter is frequently struck with leaf-blight, which at once checks growth, it is safest to bud the standard pear early. The peach and the French quince are worked towards the close of summer and the beginning of autumn. As the removal of leaves from a tree in full growth always checks it, the stocks should have the side shoots cut away to facilitate the operation of budding when necessary, some weeks before it is done, that they may recover entirely from its effects and be in a vigorous condition for the lifting of the bark. If this has not been seasonably attended to, it may be performed without detriment the same day the buds are inserted, cutting away as little as may be convenient.

It is hardly necessary to remind the operator of the importance of securing good, well ripened strong buds; of keeping the shoots well shaded and fresh during the day; and of carefully registering every variety, both by tally stakes at the ends of the rows and in a book kept for the purpose.

The best and handsomest trees are made when the buds are inserted within two or three inches of the ground. Dwarf pears should be budded at the surface. Crooked growers are sometimes worked on straight stocks three or four feet high.

Where buds fail they should be rebudded if the stocks will admit; but if not, they should be grafted the following spring.

In heading down budded stocks in spring it is important that it be done quite early or before the buds swell, especially for the pear, plum, and cherry, which are severely checked in growth by the loss

of growing buds or foliage. For the same reason all other sprouts, except from the inserted bud, should be kept constantly and closely rubbed off.

About midsummer or a little later the projecting stubs (already mentioned in the chapter on Budding) should be carefully pared down to the growing shoot. The sooner this work is done the better, that the cut surface may heal over, provided the shoot has become strong enough to prevent the danger of breaking out.

Digging or Lifting the Trees. When nursery trees have grown sufficiently for removal and transplanting, they may be taken up any time between the cessation of growth in autumn and its recommencement in spring, when the air is not freezing and the ground is open. If a whole row is to be lifted at a time, the labor may be lessened by first ploughing a furrow away from the row on each side. Then two spades made of steel and strong enough to bear the full weight of a laborer are placed on opposite sides of the tree at a distance of a foot or more from it. The blades, which are at least fifteen inches long, are thrust downwards to their full length into the soil under the tree. A lifting motion raises it with the principal roots entire. Spades for this purpose, costing several dollars each, are manufactured only by the best edge-tool makers in the country. Before or at the time of removal the trees should be marked with wooden labels furnished with copper-wire to fasten them to the limb. They are made of pine or other suitable wood, about half an inch wide, three inches long, and one-twentieth of an inch thick. A very thin coating of white-lead paint applied just before writing the name with a common black-lead pencil renders the letters permanent; but they will last a year or two if the letters are written on a moistened surface. If written dry they wash out in a few weeks.

Packing for transportation. Several million fruit trees are every year purchased by the farmers of our country. A large majority of these are conveyed long distances from the nursery by railway. Much of their safety from injury on the road, and their consequent success when set out, depends on the manner of packing. Trees may be packed so as to open from the bundle or box, after being tumbled over iron rails a thousand miles or more, as fresh, plump, healthy, and uninjured, as the moment they were lifted from the mellow soil; and they *are* sometimes packed so as to become bruised, barked, and hopelessly shrivelled before they have travelled a tenth part of that distance.

The farmers who pay the three million dollars yearly for fruit trees, should understand well the difference between good and bad packing

Whether encased in bundles or boxes, it is absolutely essential that trees be protected from bruising, and that the roots be kept constantly moist from the moment they are dug up, till they reach their destination. The first named object is accomplished by sprinkling straw through every portion of the mass of trees; and the latter by first dipping the roots in an artificial bed of thin mud, and then imbedding them in damp moss. The mud or the moss alone may answer for very short distances (the moss should, however, never be omitted); but as there are frequently unexpected detentions, the best nurserymen always pack about as well for a journey of fifty miles as for two thousand. The additional labor is but small—the benefit may be great.

Packing in boxes, which is always best for long distances, does not require so much practice, although as much care as in bundles. If the trees are all well encased in straw, or properly protected by it on every side and through every part; the roots shielded from the dry air as already stated; and sufficient pressure given to them to prevent chafing and rattling, they cannot become easily injured. The boxes need the additional strength of iron hoops at the ends and corners.

To pack a bundle or bale, first provide two simple blocks of wood, like that shown in Fig. 174, into which two diverging stakes are inserted, loosely, so as to be withdrawn easily. Place these a few feet apart, to form the trough for building the bundle. Lay the trees in this trough, perfectly parallel, and with the roots together, sprinkling straw among the stems and branches, and damp moss among the roots as the bundle progresses, until enough are ready. Fifty medium-sized trees will make a fair-sized bundle. Then tie it up with three or four twisted straw bands, as tightly as one man can conveniently draw. This may be facilitated by using first a broad leather strap to draw the bundle together. The strap may be two inches wide, eight feet long, with a buckle. The bundle is then ready for receiving the straw.

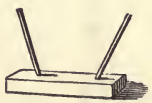

Fig. 174.

Next, place upon and across the little truck or wagon represented in Fig. 175, four strings or cords, then a layer of rye-straw, to form the outside coating. As the bundle is longer than the straw, the latter must be spliced, which is effected by first placing a layer towards the place for the roots of the trees, and then another layer overlapping this, towards the tops. Place within the side-boards other portions of straw, and finally cover the top, observing now to lay the

straw first on the tops, and lastly on the roots. Then tie together the ends of each of the four strings, which will hold the straw in place. Raise the bundle a few inches by placing beneath it short pieces of scantling, to admit passing the cord under. Then apply the rope connected with the windlass, as shown in Fig. 175, by simply passing it once around the trees. A few turns of the crank will

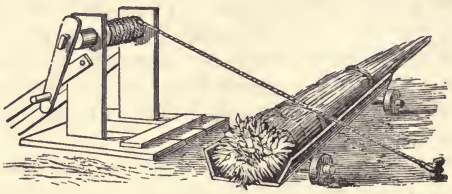

Fig. 175.

draw the bundle with great force compactly together—at which place pass a strong cord (one-fourth or one-third of an inch in diameter) and secure it by tying. Slacken the rope; move truck a foot, tighten the rope again, and add another cord. In this way proceed from bottom to top, till the straw is so firmly secured by the cords, that no handling, however rough, can displace it. By tying each coil, the rest will hold the straw if one happens to become worn off or cut. Add moss to the exterior of the roots, encase the moss in damp straw, and sew on a piece of strong sacking or gunny-cloth, and the bundle is completed, as shown in Fig. 176.

Fig. 176.

The former practice among nurserymen was to draw the bundle together by dint of stout pulling by hand; but the present mode by the use of a windlass, is not only many times more expeditious but much better—as it was formerly almost impossible to bind on the straw in so firm and secure a manner, as to withstand all the thumps and rough-and-tumble handling of modern railway hands without displacement.

The following dimensions may be useful to those who wish to construct this packing machinery; Windlass three feet high to top; posts fifteen inches apart inside; cylinder four inches in diameter; rope about eighteen feet long. The truck is about two feet wide between the wheels, eight feet long; the axles six feet apart; wheels seven inches in diameter.

When trees are always boxed, they may be secured advantageously in small bundles by this mode for placing in the boxes.

Convenient dimensions for boxes where large quantities are to be packed, are two and a half feet square and nine feet long. They should be made of light and strong boards, and if sound half an inch in thickness will answer. Four series of battens will be necessary for the length—two at the ends, and the others at intervals of three feet between. Good battens are made of elm or other wood of equal hardness and toughness, which may be sawed for this purpose into strips two and a half inches wide and an inch and a fourth in thickness. When the boards are well nailed to these battens, the whole forms a stout box. When closely and solidly packed, the lid is nailed on, and iron-hoops are nailed on the outside against every batten, and extending around the box. The direction is then written distinctly with a mixture of lamp-black and turpentine, or of lamp-black and rock-oil. The following materials should be procured beforehand for packing: Boxes, with iron-straps or hoops for the corners; moss, for the roots; straw, for the tops; labels, for designating the sorts; flag, oziers, or rye-straw, for tying bunches; large labels of cloth, parchment, or wood, for designating bunches; lamp-black and turpentine or rock-oil, and brush for marking boxes. If the trees are to be packed in bales or bundles, provide long straight rye or other straw, baling-cord, gunny-cloth or Russia mats, sewing-twine, large packing-needles, directing-labels, white-lead paint, and soft pencil.

After the crop of nursery trees is removed from the ground another one should not be planted in the same place until the soil has fully recovered from the exhaustion of the first. An intermediate crop of clover turned under for manure is found useful. There should be an interval of at least two or three years before occupying the ground again with nursery; although a less time is often given in connexion with heavy manuring.

CHAPTER XIII.

INSECTS AND DISEASES.

INSECTS are among the most formidable enemies to successful fruit-culture. It has been computed that the losses occasioned by the curculio alone amount to at least a million of dollars annually. Planters are deterred, by the attacks of this insect, from attempts to raise the apricot, nectarine, and plum; and the market supply of apples and pears is much disfigured by it. The apple worm is becoming scarcely less formidable. As a general rule those remedies are of little value which attempt merely to *repel* insects without *destroying* them at once. The first question, therefore, which may be properly asked when a remedy is proposed is—does it kill the insect?

DESTRUCTIVE INSECTS.

The Caterpillar (*Clisiocampa Americana*). This has been a most serious enemy to the apple, and some other trees, in most parts of the country. It has its seasons of increase and decrease. Some years it has nearly stripped whole orchards; and again it has diminished in numbers in successive years, till few could be found.

There are many species which feed on the apple leaf; but the one here alluded to, is that known as the *common orchard caterpillar*, which is hatched in spring as soon as the leaf-buds begin to open. At this time, it is not the tenth of an inch long, nor so large as a cambric needle, but it continues to increase constantly in size for several weeks, until two inches long and a quarter of an inch in diameter. It then spins a cocoon and passes to the pupa state. In the latter part of summer it comes out a yellowish brown miller (Fig. 177), lays its eggs, and dies. The eggs are deposited in cylinders or rings,

Fig. 177.—*Moth of Apple-tree Caterpillar.*

containing three to five hundred each, encircling the smaller branches, and usually within a few inches of the extremity. The accompanying figure (Fig. 178) represents one of these masses of eggs of the natural size. They remain through winter, protected from the weather by a vesicular water-proof varnish, and hatch in spring, as just stated. Each collection of eggs makes a nest of caterpillars.

Fig. 178.

One nest is enough to defoliate a large branch, and when several are on a tree, the size and quality of the fruit are seriously lessened.

The best mode for their destruction, is to cut off the small branches which hold the eggs during autumn or winter, and commit them to the fire. The most convenient implement is a long pole, armed with a pair of clipping-shears, worked by a cord; or a sharp hooked knife, on the end of a pole, will answer nearly as well. The eggs are seen at a glance, after a little practice. If this work is done just at the moment the eggs are hatching, it will be equally efficacious, and the webs or downy covering of the young insects render them conspicuous. Every nest of eggs thus removed, which is done in a few seconds, totally prevents a nest of caterpillars in the spring, and is far more expeditious and effectual than the usual modes of brushing off the caterpillars with poles, brushes, or washing them with soap-suds, lye, or whitewash at a later period.

Dr. Fitch says:—"If sulphur be dusted upon the leaves it increases the appetite of the caterpillars, whereby they eat the leaves more greedily and grow more rapidly. Yet it has been published as a remedy for these caterpillars, to bore a hole in the trunk of the tree and fill it with sulphur!" The best remedy is, to be on the look-out for the eggs of these caterpillars.

The Borer (Saperda bivittata). This insect enters the tree and cuts into the solid wood near the surface of the earth. It is a dangerous enemy; for while only a few small holes are perceived in the bark outside, it may have perforated the wood internally in all directions and reduced it to a mass of powder.

Not only the apple-tree, but the quince, mountain ash, and hawthorn, suffer greatly from the attacks of this insect.

The perfect insect is a brown and white striped beetle (Fig. 179), about three-fourths of an inch long, which flies at night. It deposits its eggs late in spring or the first of summer, in the bark near the surface of the ground, and sometimes in the forks of the branches. The first indication of its presence is the appearance of numerous small round holes, as if the bark had been perforated by buck-shot. These holes will soon become more visible by the ejected dust.

Fig. 179.—*Apple-tree Borer.*

Dr. Fitch gives the following distinct account of this insect in the *Illustrated Annual Register:*

"The beetle comes abroad in June, and drops its eggs under the loose scales of the bark, low down near the surface of the earth. The worm which hatches therefrom eats inward through the bark, till it comes to the wood. It there remains, feeding upon the soft outer layers of the wood, and thus excavating a shallow round cavity under the bark, the size of a half-dollar; though where two, three, or more worms are lodged in the same tree, as they always preserve a narrow partition between their cells, one never gnawing into that of another, these cells by crowding upon one another become of an irregular form, and almost girdle the tree. The cell is always filled with worm dust, crowded and compacted together, some of which becomes crowded out through a crack in the bark, or a hole made by the worm. And it is by seeing this sawdust-like powder protruding out of the bark, that we detect the presence of these borers in the tree. The worm continues to feed and enlarge its cell under the bark for about twelve months, until it has become half grown and is from a half to three-fourths of an inch in length. Its jaws have now acquired sufficient strength for it to attack the solid heart wood of the tree, and it accordingly bores a cylindrical hole from the upper part of its cell, upward in the solid wood, to a length of three or four inches or more, this hole inclining inwards towards the centre of the tree, and then curving outwards till its upper end comes again to the bark. It then stuffs the upper end of this passage with fine chips or worm dust, and its lower end with short fibres of wood, arranged like curled locks of hair, thus forming an elastic bed on which to repose during its pupa state. These operations being completed, it throws off its larva skin and becomes a pupa, usually at the close of the second summer, or about fifteen

months after it hatched from the egg. In this state it lies through the winter, and changes to its perfect form the following spring, but often continues to lie dormant several weeks after its final change, until the season becomes sufficiently warm for it to come abroad. Awaking then into life and activity, it crawls upwards, loosening and pulling down the chips and dust that close the upper end of its bur row, till it reaches the bark. Through this it cuts with its jaws a remarkably smooth round hole, of the exact size requisite to enable it to crawl out of the tree. The sexes then pair, and the female deposits another crop of eggs."

Remedies. It is nearly impossible to save a tree, unless taken early. At the first, the insect may be cut out with the point of a knife. If deeper in the wood, it may be extracted by a flexible barbed wire, or punched to death in its hole by a flexible twig. To prevent the insect from emerging and laying its eggs, it is doubly important that this be done early in the spring; but the trees should be repeatedly examined at other periods of the year.

Various remedies have been proposed to prevent the beetle from laying its eggs in the bark. A mixture of tobacco water, soft-soap, and flour of sulphur, applied to the bark in the form of a wash, or soft soap alone used in the same way, has been attended with partial success. The application should be made towards the end of spring, and repeated for a few weeks if washed off by rains. But the best and most perfect remedy is the examination of the tree, and the destruction of the young insects as already described.

The Apple-worm (Carpocapsa pomonella) attacks the fruit, by entering at the blossom, and feeding at the core. In some years, it has been so common, as seriously to injure the quality of the crop. The best preventive is to allow swine or sheep to pick up the wormy fruit as it falls, thus destroying the enclosed insect, and preventing its spread. Sheep may be prevented from eating the bark of the trees by rubbing the trunks with blood, which is easily done with a piece of liver from the butcher.

The following figures (Fig. 180) exhibit the apple-worm in its different stages; *a*, the larva; *b*, the same magnified; *c*, the cocoon; *d*, the pupa within the cocoon; *e*, *f*, the perfect insects, known as the "Codling moth;" *g*, the young larva, just hatched, after having been deposited within the calyx; *h*, *i*, *k*, *l*, the progressive work of the larva within the apple, till it escapes.

Aphis. Aphides, or plant lice, frequently infest the leaves of the apple, pear, cherry, etc. When they appear in vast numbers, covering the surface of the leaves and twigs, they retard growth and injure

the trees by sucking the juices. They may be destroyed by a solution of whale oil soap, or even by common soap-suds. It may be applied with a syringe; or young trees in the nursery, and their branches, may be bent over and immersed in the liquid contained in a large pail. It should be repeated as often as they reappear, and

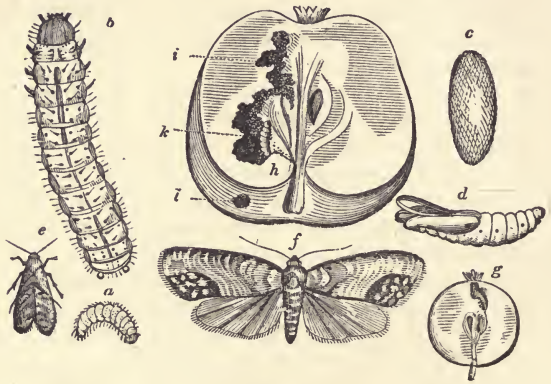

Fig. 180.

the evening is the best time to apply it. If too strong, it may injure the leaves, and a previous trial on a single tree as a precaution is best, till the right degree of strength is ascertained.

The *Woolly Aphis* (*Aphis lanigera**), a European insect, falsely termed American blight, is a species of aphis or plant-louse, covered with long, white, cottony hair. In England it has proved very destructive; and on young trees in this country it has done some injury. It is destroyed by whale-oil soap, and by lime-wash.

The apple-root aphis (*Pemphigus pyri*) penetrates the roots and causes knobby excrescences, which, when numerous, check and injure the tree. To destroy it, scrape the earth away, and wash with strong soap-suds.

The *Apple Bark-louse* (*Aspidiotus conchiformis*) is thus described by Dr. Fitch:—"It makes its appearance as a little brown scale, one-eighth of an inch long, the shape of an oyster shell, fixed to the smooth bark, resembling a little blister. This scale is the dried remains of the body of the female, covering and protecting her eggs,

* *Eriosoma lanigera*, of later naturalists.

from a dozen to a hundred of which lie in the cavity under each scale. These eggs hatch the latter part of May, and the young lice diffuse themselves over the bark, appearing as minute white atoms, almost invisible to the eye. They puncture the bark, and suck the sap from it. The females soon fix themselves and become stationary. They die and become overspread with a substance resembling fine blue mould, which, wearing off, the little oyster-shaped scale again appears in July. They sometimes become so multiplied that the bark of the trunk and limbs is everywhere covered and crowded with them, and if the tree is weakened by borers, fire blight, or other disease, these bark-lice thus multiplying, kill it. In years past, over all the country adjacent to Lake Michigan, every apple-tree has been destroyed by this insect."

The late A. G. Hanford was successful with a mixture of equal parts of tar and linseed oil, applied warm, *not hot*, early in spring, to the bark. This mixture does not continue soft and spread over the surface and close the pores so as to kill the tree, as grease would do; but it forms simply a *varnish*, which soon becomes hard, and when the tree appears in leaf and begins to grow, this varnish cracks and peels off, carrying the bark-lice with it, and leaving the bark fresh and smooth. Dr. Fitch, in his Treatise on Insects, mentions another remedy which he considers very efficacious, prepared as follows:—Leaf tobacco is boiled in a strong lye until reduced to an impalpable pulp, and this is then mixed with soft soap (which has been made cold, and not boiled), the whole mixture becoming of the consistence of thin paint; this, when applied, does not easily wash from the tree, as lye, tobacco water, etc., would alone. One application with the brush to every part, will protect trees two years. A young orchard of one hundred and fifty trees, required two men a fortnight to go over every part, branch and twig, through the orchard. The trees grew thriftily, and were perfectly free from lice, while others in every direction were dying from their attacks.

Quassia, soda wash, etc., have been strongly recommended, but are much less efficient. Scraping and scrubbing, in summer, with a stiff brush, in soap suds are useful. Thriftiness from good culture is the best preventive; and trees badly affected should be cut up and burned.

The *Canker Worm* (*Anisopteryx vernata*). This caterpillar appears to have been, as yet, chiefly confined in its destructive ravages to portions of New England. The following figures represent the perfect insect, the male with wings, the female nearly destitute (Fig. 181). The canker worm attacks both fruit and leaves; when

numerous, the small webs it makes, added to the destruction of the foliage, give the tree the appearance of having been scorched. The remedies consist in various contrivances to prevent the female insects ascending the tree. One mode is to encircle the trunk with a canvass belt, coated with a mixture of tar and train oil The mixture needs repeatedly renewing. Applying the tar directly to the bark endangers the life of the tree. Dennis's lead troughs, filled with oil, have proved effectual. Circular strips of zinc, about four inches wide, passing around the trunk of the tree, the lower

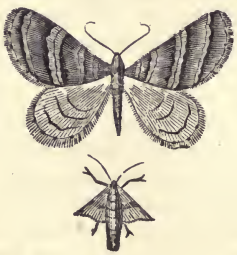

Fig. 181.

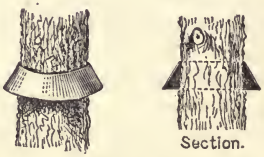

Fig. 182.

edges standing out, as shown in Fig. 182, prove the most efficient remedy, as the insects cannot pass the lower rim. Sheet iron will not answer, as they cling to the rusty edge.

The *Peach-worm* or *grub* (*Ægeria exitiosa*, *Trochilium exitiosum*, of later authors) cuts into the bark (never far into the *wood*), just below the surface of the ground. It attacks the peach, nectarine, and apricot. Its presence is indicated by the exudation of gum at the root, mixed with excrementitious matter resembling sawdust. It is very easily destroyed by scraping away the earth at the foot of the trunk, and following the worm to the end of its hole with a knife, beneath the thin shell of bark, under cover of which it extends its depredations. If an orchard is thus examined once in spring and once in early summer, few will escape. But to exclude the insect, as a means of prevention, heap around each tree a small mound of air-slaked lime or ashes, coal ashes, or even earth, in spring, allowing it to remain till autumn. Encasing the foot of the tree with pasteboard, or with stout oiled or painted paper during the summer, effectually prevents the deposit of eggs in the bark.

The perfect insect of the peach-worm, Figs. 183 and 184, is a four-winged moth, resembling in form a wasp, but totally distinct, and in its character and habits closely allied to the butterfly and miller.

It deposits from early in summer till autumn, at the foot of the tree, its exceedingly minute, whitish eggs, which soon hatch, and the larvæ or worms enter the bark. The next season they encase themselves in a sawdust-like cocoon, in their holes under the bark; and emerging as perfect insects, lay their eggs and perish. The perfect insect is very rarely seen, but is easily obtained by inclosing the

Fig. 183.—*Peach-tree Borer.* (Male.)

Fig. 184.—*Peach-tree Borer.* (Female.)

pupa, Fig. 185, *b*, *c*, which is readily obtained in summer at the roots of neglected trees, beneath a glass, or in a gauze case. As this insect confines itself to the *bark*, its destruction is very easy. It rarely happens that trees are completely destroyed by it, unless they are small; death can only take place when the tree is girdled. Timely care will prevent this; the evil, in fact, is only to be dreaded by negligent cultivators.

The "*Cherry Slug*" (*Selandria cerasi)* (Fig. 186), when in large numbers, does serious injury by eating the leaves. It is sometimes very destructive to both pear and cherry-trees. This animal, which

Fig. 185.—*Pupa of Peach-borer.*

Fig. 186.

is the larva of an insect, is about half an inch long, and of a dark greenish brown when filled with food. Its smooth, shining, and jelly-like skin, and snail-like appearance, have given it the name "*Slug.*" It may be repelled by dusting the cherry leaves regularly, while wet with dew, with dry fresh ashes. Sand or pulverized earth, thrown briskly among the leaves, also repels it. Doubtless a fine

dusting of white hellebore, found so effectual for the currant-worm, would destroy it.

The *Curculio* (*Rynchænus nenuphar*, *Conotrachelus nenuphar*, of some writers), represented in the annexed figure (Fig. 187), is a small insect not more than the fourth of an inch long, of a dark brown color, the sheaths covering the wings slightly variegated with lighter colors, the body resembling in size and appearance a ripe hempseed. It is distinguished by an elongation of the head, resembling a conspicuous rostrum or beak projecting from the front part of its thorax.

About the time the young fruit attains the size of a pea, the cur-

Fig. 187.—*Curculio.*

Fig. 188.—*Young Plum, stung by Curculio. Magnified twice.*

culio begins its work of destruction. It makes a small crescent-shaped incision in the young fruit, and lays its egg in the opening. The presence of the egg may be easily detected by these incisions upon the surface; the above figure (Fig. 188) represents one of these magnified twice in diameter. The egg soon hatches into a small white larva, which enters the body of the fruit and feeds upon it, causing, usually, its premature fall to the ground.

The period at which the young fruit falls, after being punctured, varies with its age at the time of the injury. Those first injured drop in about two weeks; but if the stone is hard when the egg is laid, the fruit remains till near the usual period of ripening, sometimes presenting a fair and smooth exterior, but spoiled by the worm within.

The insect, soon after the fall of the fruit, makes its way into the earth, where it is transformed into the perfect insect or beetle, to lay its eggs and perpetuate its race.

The curculio travels by flying, but only during quite warm weather, or in the heat of the day. The insects mostly confine themselves to certain trees, or to the same orchard. But the fact that newly bearing and isolated orchards are soon attacked, clearly shows that in

occasional instances they must travel considerable distances. Indeed, they have been known to be wafted on the wind for a half mile or more, the windward side of orchards being most infested, immediately after strong winds from a thickly planted plum neighborhood. In the cool of the morning, they are nearly torpid, and can scarcely fly, and crawl but slowly; hence, at this time of the day they are most easily destroyed.

Their flight appears to be never more than a few feet from the ground, and successful attempts have been made to shut them out of fruit gardens by means of a tight board fence, nine or ten feet high, entered by a tight gate.

The remedies for the curculio are various. Those which merely repel without destroying the insect, and which are consequently inefficient, include such as coating the young fruit with tobacco or lime-wash, or applying salt, offensive odors, etc. Among efficient remedies, which kill the insects, are jarring them down on sheets spread under the tree, and destroying the young larvæ in the fallen fruit by means of animals confined in the orchard, or by sweeping up the fallen fruit and feeding it to swine.

Jarring down on Sheets. Several contrivances have been proposed for spreading the sheets under the trees, on which to jar down curculios for the purpose of killing them. After trying a number, we find nothing better, and none so cheap and quickly made, as the contrivance represented in the accompanying cuts. Fruit raisers often omit their attacks until too late, because they have no frames ready at the time. The one here described may be made in five minutes, and the sheeting when done with used for other purposes. For small or young trees, two pieces, each a yard wide and two yards long, will be sufficient. For larger trees procure wider stuff, and give another yard in length. It may be necessary for old trees, to stitch two pieces together, but this can scarcely be needed where wide sheeting is at hand.

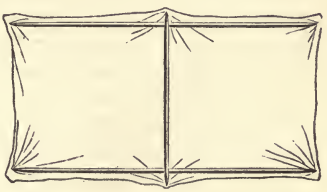

Fig. 189.

To stiffen these pieces take small rods, or long pieces of laths of a length equal to that of the sheeting, and sharpen both ends. Punch these ends into the four corners, so as to produce tight stretching, as shown in the figure (Fig. 189). A notch cut in the wood a short distance from the point, will prevent the cloth from slipping too far down. Then take

another rod sharpened at both ends, with a length equal to the breadth of the sheet, and insert it crosswise, placing it atop the other two rods, and bringing up the edge of the sheeting to receive its points. A notch cut near each end of the rod for the others to drop in, will prevent them from springing in; or a small nail may be driven through for the same purpose. The thing is now complete; and one person, taking these cross-pieces as handles, will carry them readily from tree to tree, and place them on the ground beneath, without any waste of time. By jarring with a hammer or sledge, and pinching between thumb and finger, he will destroy hundreds in a short time.

If these sheets are quite large, it will be best to place stiffeners at each end, as shown in Fig. 190. These rods, if nothing better is at hand, may be made by cutting long green poles, or shoots of bushes, and peeling the bark off. One-half to three-fourths of an inch in diameter, will be large enough.

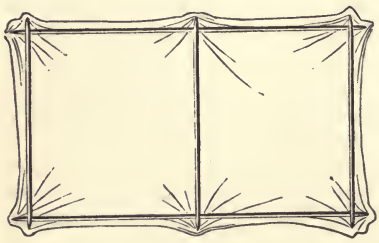

Fig. 190.

Should the insects be very abundant, they may be destroyed by throwing them into a pail of hot water, or, still better, into a small tin vessel of kerosene, by varying the contrivance as follows:—Instead of the stiffeners across the ends, formed by single rods, let them be two short rods, meeting in the middle. When the middle rod is pulled out these will form a sort of hinge, so that the two sides of the sheet may be folded up like the covers of a book, and the insects thrown down into the trough thus formed, and thence into the vessel In dislodging the insects from the tree, much depends on a sharp, stunning blow. It may be given by the stroke of a mallet, upon the short stump of one of the smaller limbs, sawed off for this purpose, and which prevents bruising the bark. Or a mallet may be thickly covered with woollen cloth encased in India-rubber, to prevent injury to the tree; but the jar is less sudden in this case. The late David Thomas (who first proposed jarring down on sheets), in a communication to the Genesee Farmer, in 1832, says: "Not three days ago I saw that many of the plums were punctured, and began to suspect that *shaking* the tree was not sufficient. Under a tree in a remote part of a fruit-garden, having spread the sheets, I therefore made the fol-

lowing experiment: On *shaking it well*, I caught *five* curculios, *on jarring it with the hand*, I caught *twelve* more; and on *striking the tree with a stone, eight* more dropped on the sheets. I was now convinced that I had been in an error; and calling in the necessary assistance, and using a hammer to jar the tree violently, we caught in less than an hour, more than two hundred and sixty of these insects." With large trees, it may be necessary to jar each limb separately, by means of a pole.

The best time for this work is in the cool of the morning, when the insects are partly torpid with cold, and drop quickly. At midday they retain their hold more tenaciously, and more quickly escape. The work should be commenced very early in the season, as soon as the fruit begins to set, or is not larger than a small pea. With properly stiffened muslin frames, a few minutes are sufficient for many trees, and labor equal in the aggregate to that of a single entire day, may save large and valuable crops.

2. The other class of remedies includes the different means of destroying the fallen fruit as soon as it drops, and before the larvæ escape to the earth. One of these consists in beating the ground smooth or paving beneath the tree, sweeping up the fallen fruit daily, and feeding it to swine, or otherwise destroying it.

Confinement of Swine. But more easily applied than the last, is the *confinement of swine* beneath the trees. They immediately pick up and destroy the punctured fruit. Experience has thoroughly established the efficiency of this method, where a sufficient number of swine has been allowed the run of the orchard. Geese and hens are, to a limited extent, useful in repelling or destroying the curculio.

To apply this remedy most efficiently, all the trees of the apricot, nectarine, and plum, should be planted apart from the rest of the orchard, so that swine may be exclusively confined among them, where they should be allowed to remain the whole season, except during the period of the ripening of the fruit. It will be quite necessary, however, to protect all the younger trees from these animals by encasing them in board boxes, or by tying round them a mass of sweet-brier limbs, or other densely prickly or thorny plant.

Dr. Kirtland says: "This insect, in one season, destroyed every plum on my farm, except the crop of one tree in my swine lot; that tree is bending under its load of fruit." A cultivator in western New York, by the large number of hogs kept in his plum-yard, had abundant crops for more than twenty successive years, while his neglectful neighbors lost the greater part of theirs. It may, how-

ever, happen in thickly planted neighborhoods, that swine may not prove a sufficient protection; but we know of no instance where abundant crops have not been obtained by combining the two remedies of swine and jarring down the insects.

The curculio appears to prefer the nectarine to all other fruits for the lodgment of its eggs, and next to this the plum and apricot. A large portion of the cherry crop is frequently more or less injured, and sometimes wholly destroyed; and for this reason it may usually be expedient to give it the benefit of the protection of swine in the same enclosure with other smooth stone fruit. The peach is sometimes destroyed, and some varieties of the apple are much stung, as indicated by the crescent-shaped incisions; but the larvæ rarely reach so far as the core, and usually perish within the flesh of the fruit.

It was formerly supposed that the instinct of this insect would prevent it from depositing eggs on branches hanging over water; but recent experiments prove that it possesses no such sagacity. The only benefit resulting from the water beneath the tree, was the destruction of the egg or larva by drowning. A partial preventive, known as the Matthews Remedy, consisted in deeply spading the ground beneath the tree at the first appearance of the perfect insects when about to emerge from the soil. This turned them back, at least for a time, and lessened their numbers.

The Rose Bug (Macrodactylus subspinosus). This beetle suddenly appears in great numbers in portions of the country and in occasional years, proving exceedingly destructive to the flowers and foliage of various plants, more particularly of the rose, apple, and grape. It has been known to devour the young fruit of the apple early in summer for successive years, entirely destroying the crop. It attacks and devours the flowers of the grape. It is one-third or half an inch long, sometimes varying in color, but usually a mixture of grey and yellow; being sluggish in its movements, it is easily caught in large numbers in tin basins containing water, by jarring the branches. This appears to be the only effectual remedy, and must be unremittingly applied for successive days, as long as the insects make their appearance. Dr. Fitch reports an instance where, on a single quarter of an acre, at least a hundred thousand were killed in a week, when they were subdued.

The Currant Worm, which has of late years proved so destructive to both currant and gooseberry, by devouring the leaves, and as a consequence, preventing the growth of the shoots and the ripening of the fruit, may be easily and quickly destroyed by a

thin dusting of white hellebore upon the leaves. It may be procured of druggists, and applied by means of a dredging-box with fine orifices. Care should be taken not to inhale the poisonous dust. As soon as the worms devour the leaves with this thin powder they perish; and where the work has been well done, thousands have entirely disappeared in a day. The greatest vigilance is requisite to begin this dusting before serious damage is committed; and a watchful eye should be kept upon the bushes for several weeks afterwards, and the remedy repeated if a second brood appears.

The entire defoliation of currants and gooseberries for a single summer greatly injures the bushes; and if continued for successive years, destroys them.

The Thrips. The following account is given by Fuller: "These are very minute insects, scarce exceeding one-sixteenth of an inch in length. They are usually of a pale greenish-yellow color, or nearly white. They attack the under side of the leaves of the grape, and their presence is soon shown by the pale green or yellow spots which appear upon the upper side. The thrips seldom attacks the vine in the open air, confining itself mainly to those that are grown under glass, or against a wall or building. Sometimes thrips will attack the fruit when it is nearly ripe, but usually they confine themselves to the leaves. Syringing the vines with a strong solution of tobacco-water is one of the most effectual modes of getting rid of this little pest."

Grape-Vine Flea Beetle (Haltica chalybea). This is a small shining beetle about one-sixth of an inch long, usually of a steel-blue color, but often varying from green to purple. It feeds on the buds of the vine, eating out the interior, and sometimes attacks the plum. It never appears in very large numbers, and hand-picking appears to be the surest way of destroying it. It is also caught by placing a small, deep tin vessel, containing a little molasses, with its mouth up against the vine, and driving it down into the vessel by placing the hand above. *See also Appendix.*

DISEASES.

Blight. A most formidable difficulty in the cultivation of the pear, is the *blight*, known in its modifications, supposed or real, by the names *fire-blight*, *insect-blight*, frost-blight, and frozen sap-blight. The causes may be various, but the appearances are the same—a sudden withering and turning black of the leaves on certain limbs during rapid growth, and while the rest of the tree

remains apparently in full vigor, the evil extending downwards, unless naturally or artificially checked, till the whole tree is destroyed.

After a close investigation for years, by the most skilful cultivators in the country, a satisfactory explanation, applicable to all cases, has not been made.

The earlier theory was, that the hot rays of the sun produced the disaster, and hence the original name fire-blight. This was confirmed by the fact that the blight was often most fatal in the hottest summers; and weakened by the opposing fact that shaded portions of the tree were as frequently attacked as those fully exposed to the action of the hot sun.

It was subsequently discovered that a small insect *(Scolytus pyri)*, by the supposed infusion of poison, caused the death of the branches, but no general or wide destruction of the pear could be traced to this source.

More recently, the *frozen-sap* theory has been more extensively adopted. The explanation by this theory is as follows: A damp and warm autumn causes a late and unripened growth of wood, imperfectly able to withstand the effects of winter. It is acted upon by severe frosts, not, however, so as to produce immediate death or winter-killing, but resulting, sooner or later, in disease and partial decomposition of the sap, by which it becomes poisonous in its nature, and by passing downwards through the bark, spreads death in its progress.

This theory is corroborated by many local observations, and by the general fact that the blight is much more destructive in the warm and fertile valleys of southern Ohio, where vegetation continues late, is more succulent in its texture, and where the frosts are sudden and sharp, than in the dryer and cooler climate of New England. But this same reason is also adduced in support of the original *fire-blight* theory, and indeed it applies with strength to both.

But after admitting that the different theories may be in part correct, and that the blight may be caused by a combination in a greater or less degree of each assigned cause, we are driven to the conclusion, from a large number of observations, of which these limits preclude even a brief recital, that the cause of the blight, like that of the potato disease, remains hidden, in a large number of instances, from our knowledge. And that, whether the latent tendency to disease is only increased and developed by changes of the weather, or whether those changes actually produce them, is yet enveloped in doubt.

Happily, however, *the remedy* is not so uncertain. For whether caused by an insect, or by the poisonous influence of the descending juices, its progress must be arrested by an immediate excision of the dead branches. And, as the poison passes downwards some time before its effects are visible externally, the amputation must be made two or three feet below the affected part, if the poison as well as the dead part is to be removed. Equally necessary is it, that the infection of the diseased limbs be removed as speedily as possible out of the way, by burning.

This remedy cannot be effectual, unless promptly and fearlessly applied. Many cultivators, in fear of mutilating their trees, do not cut low enough, and leave the seeds of death remaining in the tree. Others delay the application of the remedy for a number of days, till cure is hopeless. In extensive and malignant cases, the disaster may be difficult to subdue even by the most prompt measures; but in ordinary instances success will follow. In any event, it will be better to cut away and burn by successive portions a whole tree, than to lose it entire by this disease, a result equally certain, with the added evil of spreading the malady.

Two contiguous neighbors had each a large pear orchard; one of them neglected all attention, the other spent ten minutes daily in the examination of all his trees, and in cutting out freshly diseased limbs. The former lost many entire trees; the latter saved every one, and kept his orchard nearly clear. Young trees in close rows have been attacked successively till all perished; in other rows where the affected trees were quickly removed, few of the remainder suffered.

The practice of cutting down trees to within two feet of the ground (when not exceeding ten years of age), as soon as blight appears, has resulted in perfect success, a new head springing up from the healthy stump, in the form of a handsome pyramid. The operation, however, cannot be well performed unless the disease appears after midsummer, or when the trees have nearly ceased growing for the season.

Among preventives, a good, firm, and dry soil, and a site favoring the early ripening of the wood, and adverse to a late succulent growth, hold an important rank. Plant the trees on soil of medium fertility, and maintain an annual growth of shoots from one to two feet in length, by constant cultivation. The bark thus becomes more able to resist changes and disease as the growth is moderately vigorous, and healthy and matured.

The attempt has been made to select those varieties least liable

to blight, but results vary so exceedingly, that nearly all efforts have proved fruitless. But among those which have escaped in the largest number of instances may be named, first, the Seckel, which is scarcely ever destroyed even at Cincinnati, and the White Doyenné. The Madeleine, Winkfield, and Passe Colmar appear to be more liable than the majority of sorts.

The Blight in the apple and quince, which sometimes kills the terminal shoots on the branches, has been variously ascribed to the sting of an insect and to the effects of weather. The cause does not appear to have been satisfactorily ascertained. It rarely proves a formidable disaster; but sometimes the trees are much disfigured by it, and temporarily checked in growth.

The *black excrescences* on the shoots and limbs of the plum and Morello cherries, Fig. 191, known as the *black knot*, are produced by the spores of an internal fungus, but supposed by some the work of an insect, or the result of diseased sap or cells, or regarded as a sort of vegetable ulcer. They have been by some attributed to the curculio, an opinion originating from the occasional detection of this insect within the pulpy excrescences, but entirely disproved by the facts that the curculio has existed in vast numbers in neighborhoods where the excrescences are unknown; and on the other hand, that the excrescences have ruined trees in places not infested with the curculio; besides which, the most rigid search of newly forming knots has failed to detect the eggs or larvæ of the curculio, which are only occasionally found when deposited at a later stage in the large pulpy swellings.

Fig. 191.

Sufficient evidence appears to have been furnished to prove that a tree, badly diseased, is infected throughout with the poison; as suckers from such a tree will always sooner or later become affected. Buds from diseased trees, placed in healthy stocks, soon exhibit the excrescences. But seedlings or suckers from a healthy tree usually escape, unless in near proximity to unhealthy trees.

The remedy for this disease is certain and efficient, if vigilantly applied. It consists in cutting off and burning all the excrescences as soon after their first appearance as practicable. If the tumors, however, break out on the trunk or main limbs, it may be difficult to do this without cutting away the whole tree. As much of the wood is therefore to be cut out as may exhibit indication of disease; and the wound washed with a solution of chloride of lime. The

only instances where the remedy has failed, is where it has been but occasionally applied, or where the disease has been suffered to spread for a time unchecked. The only way is to cut and continue cutting, so long as any traces remain. As a general but not universal rule, the yellow plums are not so liable to excrescences as purple varieties, unless surrounded by diseased trees.

The *leaf-blight*, or premature casting of the foliage, proves in some seasons a serious disaster to the plum, as it checks the growth of the shoots, and prevents the ripening of the fruit. Occasionally it has been so severe as to spoil entirely the value of the crop.

The leaf-blight of the pear proves a formidable obstacle in raising pear seedlings, attacking the leaves often by midsummer, and causing an immediate suspension of growth. No satisfactory remedy has been discovered—the best preventive is a deep, rich soil, and good cultivation to produce strong growth. This disease is evidently caused by a minute parasitic fungus; and a similar fungus attacks the leaves and fruit of larger trees, producing the disaster known as *cracking of the fruit.* Some varieties are more liable to crack than others; and while in certain localities it renders them worthless, in others they entirely escape. In some instances the disease has gradually extended over certain varieties from one district of country to another. No remedy has yet been found.

The Yellows. The disease termed the *Yellows* is truly formidable. It is peculiar to the peach and nectarine. It has destroyed whole orchards in portions of the country, and for a time induced the entire abandonment of the peach culture in certain localities.

The cause of this malady has not been satisfactorily ascertained. According to conjecture, it has arisen originally from exhaustion by deteriorated soil, overbearing, and neglected pruning and bad cultivation. But whatever may have been its origin, it appears at present to be chiefly communicated from diseased trees. It is quickly induced by inserting the bud from an affected tree into a healthy stock. It spreads by contact with diseased roots; a knife used in pruning the tree will infuse the poison if used on another. It appears to be communicated without actual contact, the healthy branches nearest a diseased tree being usually first attacked. It is also probable that the stones from diseased trees cause its development after a few years' growth. Its highly contagious nature, when in its most virulent form, is indicated by the equal facility with which young and vigorous trees, and old and feeble, may be inoculated by contact.

Its infallible indications are, first, a *premature ripening of the*

fruit, some weeks earlier than usual—accompanied with a rather insipid flavor, and with *purple discolorations of the flesh.* These usually occur the first season, and on a part of the tree which has been first inoculated with the poison. The following season, numerous small wiry shoots are frequently thrown up from the larger branches, the leaves become yellow, the whole tree assumes a sickly appearance, and eventually perishes. No instance is known where a decidedly developed case of this disease has ever been cured. When once attacked, to prevent a spread of the disease, the tree should be immediately removed and burned. No young trees should be planted on the same spot, as the diseased roots still remain. Stones for seedlings should be procured from districts of the country where it has not been introduced.

In some parts of the country, possessing a strong fertile soil, as, for instance, portions of Western New York, this disease has not spread extensively when introduced from abroad. It has generally destroyed a few trees near the affected ones, and has then disappeared.

The *curl of the leaf*, in the peach, occurs during the early part of the season, and appears to be caused by a minute internal fungus in the pores of the leaf, developed by cold weather. The only known remedy is a thrifty growth, imparted by good cultivation and pruning back. When the disease is severe, it destroys most of the foliage, and injures and sometimes kills the tree.

Mildew of the Peach. The growth of peach-trees is often retarded by mildew. It seizes the tender points of the shoots and young leaves, and sometimes wholly stops their growth. It is confined to glandless, cut-leaved varieties only; such as the Early White Nutmeg, the Early Anne, and some of the earliest varieties of the Red Rareripe. Yellow-fleshed peaches rarely or never suffer from it. It is not often a formidable evil, although it seriously lessens the thrifty and handsome appearance of some varieties while growing in the nursery.

It is a minute fungus, and may be destroyed or lessened without injury to the tree, by syringing with soap-suds on its first appearance. A mixture of lime-water with the soap-suds is preferred by some cultivators, and a subsequent dusting with sulphur has been recommended. A thrifty growth and good pruning are, however, usually the best remedies.

Mildew of the Gooseberry. This is the most serious obstacle to the successful cultivation of the foreign gooseberry in the United States. In the cool and moist climate of England, it does not

exist; in the extreme northern parts of the Union, it is not formidable; but on approaching the Middle States, although the bushes grow vigorously and set abundant crops of young fruit, the latter become covered with a thick brown or grey mildew or scurf, which destroys their value.

Manuring, high cultivation, and pruning, will in some cases prove sufficient to prevent mildew. This may be assisted by the cautious application of salt, either thinly over the soil, or directly upon the plant; in the latter case, the solution should be so thin that the saline taste may be just perceptible. Shading by a thick coat of salt-hay, appears to be an efficient remedy. It should be spread in a layer of several inches or even a foot in thickness, crowding it down to make room for the branches. This should be done in spring.

Mildew of the Grape. This always attacks vines of the exotic grape after they have grown a few years in open air. In unfavorable seasons a similar disease assails many varieties of the American grape. The best general preventive appears to be, keeping the vines thrifty and vigorous by pruning and cultivation; and the admission of light and air by a sufficient thinning and distance in planting. The best remedy appears to be dusting with sulphur. This should be applied late in spring and early in summer, on the first appearance of the disease, and repeated at intervals of a fortnight so long as may be necessary. It may be applied by an instrument similar to a hand-bellows (without a valve below), which drives the sulphur-dust, fed from a box on the upper side, through a large tube or nose terminated with wire gauze.

The Rot in the grape has proved a formidable disease, especially in the south-west. It commences with dark-colored spots on the young fruit, spreading afterwards over the berry, causing it either to fall or to shrivel while adhering to the branch. No efficient remedy has been devised, and the only satisfactory preventive is the selection of such varieties as are not liable to the disease.

CHAPTER XIV.

TERMS USED IN DESCRIBING FRUITS.

It is only by a uniform and definite use of terms that descriptions can be made intelligible to the reader. Hence a full explanation of these terms becomes a matter of importance. Distinctive characters should be permanent, and not liable to variation with a change of locality, soil, season, or climate; or, if variable, the nature of such variation should be distinctly pointed out. To assist the cultivator the more fully to understand written descriptions, the devotion of a few pages to a clear explanation of the terms used in this work, may prove useful.

I. GROWTH OF THE TREE, SHOOTS, AND LEAVES.

The form of growth often affords a good distinctive character of varieties, not liable to great variation. Young trees, only a few years old, usually exhibit peculiarities of growth more conspicuously than old trees of irregular spreading branches. Hence, in all cases, where this character is mentioned, it refers to young trees not more than three or four years from the bud or graft, unless otherwise expressed.

1. Shoots are *erect*, when they rise nearly perpendicularly from the main trunk or stem, as in the Early Strawberry apple and Bartlett pear (Fig. 192).

Diverging, when they deviate from the perpendicular at an angle of about forty-five degrees, considerable variation being found in the same tree; as in the *Domine* and *Ribston Pippin* (Fig. 193).

Spreading, when they more nearly approach a horizontal direction, as in most trees of the Rhode Island Greening (Fig. 194).

Drooping, when they fall below the horizontal, a form which many spreading shoots assume, as they become the large branches of older trees.

Ascending, when they curve upwards, as in the Gravenstein apple, and small Red Siberian Crab (Fig. 195). Erect trees usually par-

take more or less of this quality, but the Early Harvest is free from it.

Irregular, when they assume no very distinct growth, but more or less a mixture of the preceding, as Black Gilliflower, and Summer Bonchretien pear.

Straggling, similar to the next preceding, but with shoots more slender and curved, as Winter Nelis and Black Worcester pear (Fig. 196).

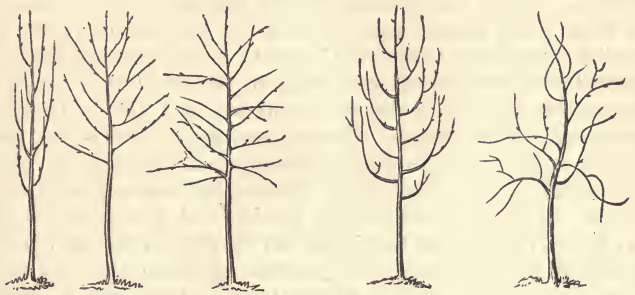

Fig. 192. Fig. 193. Fig. 194. Fig. 195. Fig. 196.

Shoots are *straight*, as in the Early Harvest and Northern Spy apples; *flexuous*, or more or less deviating from a straight line, as in the Swaar and Roxbury Russet. This distinction is very apparent and uniform in young and very thrifty trees, but not in older ones of feeble growth.

They are *stout*, as in the Red Astrachan; *slender*, as in the Jonathan apple, and Winter Nelis pear.

Trees with erect straight shoots when young, usually form more regular and compact heads in older trees; and those of a spreading habit, more irregular or drooping heads.

Some trees which grow very rapidly when young, are small when of full size, examples of which are found in the Late Strawberry and Tallman Sweeting. Others at first grow more slowly, but ultimately become large, as the Esopus Spitzenburgh. Some varieties, again, continue to increase rapidly in size at all periods, as the Northern Spy; while others of feeble growth when small, never attain much magnitude, as the Early Joe and Sine Qua Non.

2. *The color* of the shoots varies greatly in the same variety at different periods of the year, as well as with different degrees of exposure to the sun, and with a change of soil, climate, and season. When fresh or very young, all have a greenish color, but gradually

assume various shades of yellow, olive, brown, red, purple, and nearly black, as the season advances, and as they become bare and are exposed to the sun and weather. For this reason, in describing the color, the terms must be relative, and can only be correctly applied by a comparison at the time with the color of other sorts. During winter, and early in the spring, the shoots of most trees become so much darker than at other times, that it is only by practice and by placing the different sorts side by side, that accuracy may be attained. Skilful culturists will readily distinguish, by a glance at the color of the shoots, many of the kinds they cultivate; but the peculiar cast is hard to describe in words, in the same way that it is impossible to describe the handwriting of an individual, so as to be known from fifty others, although many can, at a glance, know the penmanship of hundreds of different persons. A few of the most strongly marked cases, however, present peculiarities of color, which form useful points of distinction. No one, for instance, could easily mistake the *yellow* shoots of the Bartlett and Dix pears, for the dark brown or purple of the Tyson and Forelle; or the light greenish cast of the Bough and Sine Qua Non apples, for the dark color of the Northern Spy, or dark brown of the Baldwin; nor the downy or greyish appearance of the Ladies' Sweeting and Esopus Spitzenburgh, for the clear shining brown of the Gravenstein and Red Astrachan.*

3. *The buds* sometimes afford distinct characteristics. As examples, the large, compact, and projecting buds of the Summer Bonchretien, always contrast strongly with the smaller, more rounded, and softer buds of the Madeleine. Buds are large on the Swaar and Golden Sweet, small on the Tallman Sweeting and Rhode Island Greening.

4. *The leaves*, in a large number of instances, are of use in distinguishing different varieties.

They are *even* (not wrinkled), as in the Bartlett pear and Baldwin apple (Fig. 197).

Waved, as in the Tallman Sweeting and Beurré d'Aumalis pear (Fig. 198).

Wrinkled, when the waves are shorter and more irregular, as in Green Sweet (Fig. 199.

Flat, as in the Madeleine and Skinless pears (Fig. 200).

* Nearly all shoots are more or less downy at first, but the down disappears as they grow older. Hence the term must be used relatively. In plums, the smooth, or downy shoots afford in most cases good distinctive points.

Folded and recurved, as in the Easter Beurré and Bonchretien Fondante (Fig. 201).

Fig. 197. Fig. 198. Fig. 199.

Fig. 200. Fig. 201.

Large and wide, as in the Red Astrachan and Huling's Superb.

Narrow, as in the Dyer apple, and Van Mons Leon le Clerc pear

Erect, as in the Early Strawberry (Fig. 202).

Drooping, as in Domine (Fig. 203). But these two last are indistinct characters, and only to be resorted to in a very few remarkable instances, as most leaves are erect on new shoots, and become spreading or drooping as they grow older.

Fig. 202. Fig. 203.

The *color* of the leaves may sometimes assist in description, as *light green* in the Yellow Bellflower and Rambo; *deep green*, as in the Rhode Island Greening; and *bluish green*, as in Peck's Pleasant.

The *serratures*, or *saw-teeth markings on the margins of leaves*, are characteristics of importance, in many varieties of the apple, and on the peach they are so well defined as to form a basis of the classification of varieties. The latter will be found particularly described in the separate chapter on the peach.

Leaves of apples are,

Serrate, or cut with teeth like those of a saw.

Sharply serrate, when every serrature ends in a sharp point, as in the Fall Pippin, Fig. 204.

Doubly serrate, when the serratures themselves are again minutely serrated, as in the Vandevere and Drap d'Or, Fig. 205.

Coarsely serrate, as in the Swaar.

Crenate, when the teeth are rounded, as in the Esopus Spitzenburgh, Fig. 206.

Obtusely crenate, when the teeth are unusually rounded, as in the Bough.

Finely crenate, when the teeth are small, as in the Summer Queen.

Fig. 204.—*Sharply Serrate.* Fig. 205.—*Doubly Serrate.* Fig. 206.—*Crenate.*

When the serratures are partly rounded, and irregularly and rather deeply cut, they become *toothed*, as in Ladies' Sweeting, Fig. 207.

Fig. 207.

Many varieties present intermediate degrees, as,

Serrate-crenate, partaking somewhat of both, as the Jersey Sweeting and Summer Rose.

Crenate-toothed, as in Bevan's Favorite.

Serrate, slightly approaching toothed, as in Rambo.

Flowers. In apples, pears, cherries, and most other kinds, but little difference exists in the flowers. In the peach and nectarine, however, an important division in classification is made by the great difference between those with large and small petals; one class, including the Early Ann, Grosse Mignonne, and others, hav-

ing large showy flowers; and another class, comprising the Early Crawford, George IV., and many more, having flowers with small narrow petals.

II. FORM OF THE FRUIT.

In the following pages, the *base* of a fruit or any other part or production of a tree, is the portion towards the branch or root. This is in accordance with the language universally adopted in describing plants. It has, however, been more or less departed from in the common language used to describe fruits, and especially so, as applicable to the pear. This deviation from scientific accuracy tends to confusion, and if simplicity of expression is sought, ambiguity must be avoided. The apex of the stalk of a fruit, however, to avoid the chance for a mistake, may, in all cases, be termed the *insertion*.

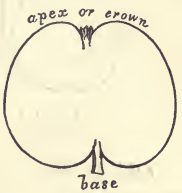

Fig. 208.

The term *apex* should be understood as applying to the part most remote from the branch or root. In fruits, it is the part opposite to the insertion of the stalk. In pears, this part is usually denominated the *crown*.

The *axis* is a line connecting the base and apex.

A *longitudinal section* is made by cutting an apple from base to apex.

A *transverse section*, by cutting it at right angles to the axis.

The *length* is the longitudinal diameter; the *breadth* the transverse diameter.

A fruit is *round* when nearly spherical, as the Fameuse and Green Sweet.

Roundish, when varying slightly from round, or when the length and breadth are nearly equal, as the Dyer and Gravenstein.

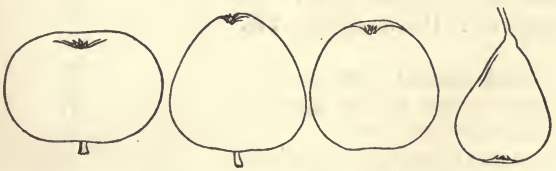
Fig. 209.—*Oblate.* Fig. 210.—*Conical.* Fig. 211.—*Ovate.* Fig. 212.—*Conic.*

Oblate, flat, or *flattened*, when the height is much less than the breadth, as the Rambo and Maiden's Blush, Fig. 209.

Conical, when tapering from the base to the apex, as Bullock's Pippin, Fig, 210.

Ovate, or egg-shaped, when the length rather exceeds the breadth, with a rounded taper from base to apex, as in the Esopus Spitzenburgh, Fig. 211.

Obovate, or reversed ovate, is when the smaller end of an egg shaped fruit is at the base, as the Buffum and Dearborn Seedling pears, Fig. 213.

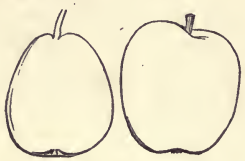

Fig. 213. *Obovate.*

Fig. 214. *Oblong.*

Fig. 215. *Round-ovate.*

Fig. 216. *Oblate-conical.*

Oblong, when the length exceeds the breadth, and the sides are nearly parallel, as Kaighn's Spitzenburgh, Fig. 214.

Obtuse, when the parts are rounded or blunt.

Acute, when any part, as the neck of a pear, tapers to nearly a point.

Fruits may partake of forms variously combined, as,

Round-ovate, when nearly round, with a slight rounded taper to apex, as Ladies' Sweeting, Fig. 215.

Round-conical, nearly the same as the last, but with the taper less rounded.

Oblong-conical, as the Yellow Bellflower.

Oblong-ovate, as the Black Gilliflower.

Oblate-conical, as the Rhode Island Greening, and Hawthornden, Fig. 216.

Depressed, pressed down, sunk, or shortened, applied to the apex of peaches, strawberries, etc.

Flattened at the ends, when the base and apex only are flattened, as the Winter Pearmain. An oblong fruit, though not flat, may be flattened at the ends; a conical fruit may be flattened at base.

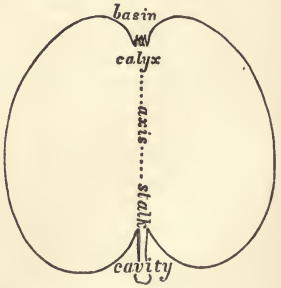

Fig. 217.

Compressed, pressed together when the sides are flattened, as in some apricots, plums, etc.

The CAVITY is the hollow in which the stalk or stem of a fruit is placed.

The BASIN is the depression which contains the calyx, eye, or remains of the blossom.

A cavity may be *shallow*, *narrow*, *deep*, or *broad*.

It may be *obtuse*, or somewhat blunt or rounded at bottom, as in the Petre pear and Pomme Grise apple, Fig. 218.

Acute, when simply ending in a sharp point at bottom, as the Baldwin, Fig. 219.

Acuminate, when ending in a long drawn out taper, as the Fall Pippin, Fig. 220. The Holland and Fall Pippin are distinguished from each other by the rather obtuse cavity of the former, and acuminate cavity of the latter.

The BASIN is always narrow in any fruit having a narrow or

Fig. 218.—*Obtuse.*

Fig. 219.

Fig. 220.

pointed apex, Fig. 221 ; it is usually wide in fruits having a wide or obtuse apex, as the Rambo, Fig. 222 ; but where the rim or boundary is broad and obtuse, the basin may be narrow, as in the St. Lawrence and Gravenstein, Fig. 223.

Fig. 221.

Fig. 222.

Fig. 223.

Fig. 224.

It is *distinct* when well defined.

Abrupt, when the depression breaks off suddenly from the rim, Fig. 224.

Even, when not furrowed or wrinkled.
Angular, with several corners.
Wrinkled, having small irregular hollows and ridges.
Waved, with gentle and irregular undulations of surface.
Furrowed, when more regularly channelled.
Plaited, having small, straight, and regular ridges.
Ribbed, with larger and more obtuse or rounded ridges.

The peculiar forms of PEARS render some additional terms neces sary :

Many pears have a *neck*, or narrower part towards the stalk, and a *body*, or larger part towards the crown, Fig. 225.

They are distinctly *pyriform*, when the sides formed by the body and neck are more or less concave or hollowed in, as in Fig. 225, shown by the dotted lines.

Turbinate, or top-shaped, when the body is nearly round and a short rounded acute neck, as in the Bloodgood, Fig. 226.

The form of different pears is further distinguished by the form of the different parts :

The neck may be long, as in the Calebasse.
Narrow, as in the Beurré Bosc, Fig. 227.
Short, as in the Glout Morceau, Fig. 228.
Obtuse, as in the Bartlett.
Acute, as in the Jargonelle, Fig. 229.

Fig. 225. Fig. 226. Fig. 227. Fig 228. Fig. 229.

Distinct, as in the Beurré Bosc.
Obscure, as in the Seckel.

The body may be *heavy* or *large*, when greatly exceeding in size the neck, as the Catillac.

Light or *small*, when not much larger than the neck, as the Wash- ington ; in which case the fruit approaches oblong in form.

Oblate, or flattish, as in the Frederick of Würtemburg.
Round, as in the Jargonelle.
Conical, as in the Vicar of Winkfield.

Ovate, as in the Marie Louise.*

CHERRIES may be *round*, *cordate* or heart-shaped, or *ovate*.

STONE FRUITS usually have a furrow on one side, extending from the stalk to the apex, termed a *suture* (literally meaning a *seam*), which sometimes occurs on both sides. It is *large*, when wide and deep; *distinct*, when clear or well defined; *obscure*, when faint; *obsolete*, when not existing, or only a faint line on the surface.

COLOR OF FRUIT. The lightest colored fruit is white, as the Snow peach; next, yellowish white; pale yellow; yellow; and deep yellow. The addition of red produces successively, orange yellow, orange, orange red, rich warm red. Shades of red, clear red, crimson when darkened, purple when blue is added, violet, less blue than in purple. Amber is a very light yellowish-brown. Fawn color is a light reddish-brown, with a slight admixture of grey.

A fruit is *striped*, when in alternating broad lines of color.

Streaked, when the lines are long and narrow.

Marbled, when the stripes are wide, faint, irregular, or waving.

Blotched, of different abrupt shades, without any order or regularity.

Clouded, when the blotches are broader and more softly shaded.

Stained, having the lighter shades of a blotched or clouded apple.

Splashed, when the stripes are much broken and of all sizes.

Mottled, covered with nearly confluent dots.

Dotted, when these dots are more distinct.

Spotted, when the dots become larger.

TEXTURE OF FRUIT. *Hard*, those which need the artificial aid of cooking to soften them sufficiently, as the Catillac pear.

Breaking, when tenderer than the preceding, but not yielding to the simple pressure of the mouth, as the Summer Bonchretien.

Buttery, when the flesh forms a soft mass, yielding to the pressure of the mouth, as in the White Doyenné and Seckel pears.

Melting, when the flesh becomes nearly or entirely liquid by this pressure, as in the Madeleine. These qualities may be combined, as breaking and melting, in the Washington; breaking and buttery, in the Onondaga; buttery and melting, in the Tyson, and in most of the best varieties of the pear.

The texture may be fine, granular, coarse, gritty, fibrous, tough, crisp, or tender.

* Cultivation influences considerably the form of pears. Thus, on a young thrifty tree, the Seckel pear has a slight neck; on an old heavily laden tree, the neck is obsolete. The body, when ovate or slightly conical on young trees, becomes rounded on older trees, and even flattened in rare instances.

THE FLAVOR may be *sweet*, *neutral*, *slightly sub-acid*, or mild sub-acid, *sub-acid*, *acid*, *very acid*, or *austere*; *aromatic* or spicy; *perfumed*, or possessing odor, and with more or less of a shade of musk; *astringent*, usually a defect, but sometimes an excellent quality, if in a very minute proportion; *rough*, astringent and austere; *vinous*, rich, high-flavored, and rather acid; *sugary* or saccharine, sometimes nearly sweet, possessing the qualities of sugar, which may be mixed with acid.

THE QUALITY is designated by *first*, *second*, and *third* rates; and fruits perfectly worthless by still lower grades. A second rate fruit, to be worthy of cultivation, must possess other good qualities in a high degree, as hardiness, productiveness, fair appearance, etc. Very few fruits, as low as third rate, can ever be worth retaining, and only for extreme earliness or other uncommon quality. Fruits that possess desirable qualities, are usually designated by three degrees of flavor; the lowest, including the best of second rate fruits, or "good second rate," are termed *good*; the lower grade of first rate fruits are termed *very good*, or *fine*; and the highest quality of all, are *best*, *very fine*, or *excellent*. Examples—Maiden's Blush apple, Napoleon pear, Lombard plum, and Crawford's Early peach, are *good*; Rhode Island Greening, Bartlett pear, Graffion or Bigarreau cherry, and Red Gage plum, are *very good* or *fine*; and Swaar apple, Seckel pear, Downton cherry, and Green Gage plum, are *excellent* or *best*.

PART II.

ON THE

DIFFERENT KINDS OF FRUITS.

The synonyms on all the following pages are given in parentheses. The most popular fruits, either throughout the country, or in their respective districts, are printed in SMALL CAPITALS; those less widely known. or of less general value, in *italics*.

The dates for the ripening of fruits given in this work, are mostly adapted to the Northern States; they should be about three weeks earlier for the latitude of Southern Virginia, and six weeks earlier for the Gulf States.

CHAPTER I.

THE APPLE.

"THE APPLE," says Downing, "is the world-renowned fruit of temperate climates." Although less delicious than the peach or pear, it possesses, from its great hardiness, easy cultivation, productiveness, its long continuance through the whole twelve months, and its various uses, an importance not equalled by any other fruit.

Nursery Management. The mode of raising the seedlings or stocks, has been already described in Chapter XII., of the first part of this work. The seedlings are treated in three different ways. They may be set out into nursery rows in the spring, when a year old, to be budded the second summer; they may be taken up and root-grafted as soon as large enough; or they may be planted into rows and grafted at any subsequent period.

Budding. When the young plants are vigorous and the land fertile, the budding may sometimes be done the first year after removal to the nursery rows, but usually the second summer will be found best, when the trees are of sufficient size, and in the highest state of vigor, and when, as a consequence, the bark will separate freely, and the work be expeditious as well as sure of success. These are headed back the following spring, according to the treatment described in the chapter on budding.

Root-grafting. This is done by whip or tongue-grafting, already described on a previous page. It is wholly performed within doors, and consequently the seedlings must be taken up the preceding autumn.

Root-grafting is well understood by nurserymen; but there are many who desire information on the subject, and especially on the expeditious performance of this operation. A grafter may work hard a whole day, and by an inconvenient arrangement of tools and materials, insert not a third as many as another, who gives careful attention to all these particulars. The following method is the result of long practice, and by it we have known a skilful workman to

insert three thousand grafts, with an assistant to apply the wax plasters, during ten hours in a single day, in the best manner, and three thousand five hundred, on another occasion, in eleven hours.

The tools consist, first, of a sharp, thin-bladed knife, of which the best is made from the blade of an old scythe, ground to its proper form on a grindstone ; second, a bench or table placed in front of a light window, and on which the work is done ; third, an apron, worn by the grafter, the two lower corners being hooked fast to two sharp nails on the near edge of the table, for holding the scions while cutting them ; fourth, strips of waxed paper, about an inch wide, made by brushing over sheets of thin, tough paper, a melted well-stirred mixture of four parts of rosin, two of tallow, and one of beeswax, and then cut into strips when precisely at a proper degree of coldness to separate well by means of a knife cutting upon a smooth board. A sufficient number of these for immediate use, should be hung near enough to the stove which heats the room, to keep the wax upon them about the consistence of butter on a summer day, so as to fit and adhere to the grafted root, without melting and running.

The first operation is to cut up the grafts from the shoots or scions. It is performed by holding the scion in the left hand, the thicker end pointing towards the right hand, which holds the knife. Such a shoot is represented of diminished size, by Fig. 230, the points, *a*, *a*,

Fig. 230.

a, the places where it is cut into grafts, and the dotted lines show how the cuts are made. Fig. 231 shows a portion of the shoot the

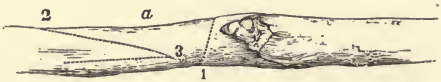

Fig. 231.

natural size ; 1, the first cut nearly directly across ; 2, the second or sloping cut, and 3, the slit for the tongue ; and the whole finished and separate in Fig. 232. Three strokes of the knife are thus required to cut and prepare each graft, and a rapid and skilful operator has done one hundred and twelve in the manner described, in five minutes. Each shoot is thus cut up while yet held in the left hand, and the grafts, as fast as they are severed, drop into the cavity

of the apron already described. The counting is done during the process of cutting, and at no other time.

Fig. 232.

The second operation is setting these grafts into the roots. Each root is held in the left hand precisely as the scion has been (Fig. 233);

Fig. 233.

the three cuts are given it (shown by the dotted lines in Fig. 234), to prepare it for the graft (as represented in Fig. 235). The grafts

Fig. 234.

Fig. 235.

having been placed directly under the operator's fingers, and in the right position, each one is successively taken and firmly fitted to the prepared root, as shown in Fig. 236, and as soon as this is done,

Fig. 236.

another cut of the knife, three inches lower down the root, severs it, and the root-graft is finished, and drops off obliquely on the table. Another sloping cut on the same root, and a slit for the tongue, are quickly made, and another graft picked up and inserted, the root

being held all the while in the left hand, until worked up. The great point is to perform much with little handling. A single root will sometimes make but one graft, but more commonly two or three, and sometimes more. Each portion of root should be about three inches long, and the graft about five inches.

Root-grafting may be performed at any time during winter, and those who have much of it to do, often continue the process the winter through. The roots when taken up in autumn, should be well washed, the tops cut off, and the roots packed in boxes with alternate layers of damp moss. Thrifty one-year roots are better and more easily worked than two-year roots. Side roots, or branches, should never be used. The scions may be kept in the same way. This is better than packing them in sand, which imparts a grit to them and dulls the knife. Different modes are adopted for packing away the grafts. The best is to place them flat in boxes, in alternate layers with sand, like miniature cord-wood, keeping the outer or graft-ends very even, and carrying up each layer separately and one at a time, so that one may be taken up for setting out, without interfering with the next succeeding pile. The sand should be slightly moist and not wet. The varieties should be distinctly marked on strips of board separating each kind, where there is more than one in a box ; and in addition to this, a card should be nailed on the outside, naming the kinds, at the point of separation between them. A record should also be make as they are deposited, of the sorts, their order, and the number of each. Boxes two feet long, a foot wide, and six inches deep, are a convenient size, and will hold from one to two thousand each. If furnished with bow handles, they are easily carried at once to the field for setting out. Boxes holding twenty thousand or more, keep the grafts equally well, but require additional labor in unpacking when set.

They should be set out in spring as soon as the soil is sufficiently dry, and there is no further danger of its freezing severely. Special pains should be taken to pack the earth well about them, as they are dibbled in. The tips of the grafts should project about half an inch above the surface. The proper depth of setting is controlled somewhat by circumstances ; if deep, the soil may be too cold to start them well ; if not deep enough, the drought of summer may destroy them. An active hand will set two or three thousand in a day, and in rare instances five thousand.

The following figures exhibit the difference between good and bad planting out. Fig. 237 represents a graft well set out, the earth packed closely around the root, which is sending out new fibres, and

the leaves expanding above. In Fig. 238 the work has been carelessly done, the earth being closed around the top, but left with a cavity below. Grafts set in this way rarely grow.

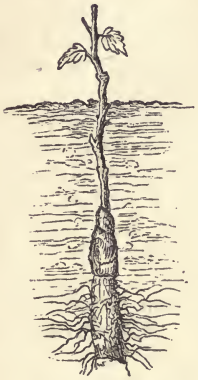

Fig. 237.—*Root-graft, set out well, with earth compactly pressed against its roots.*

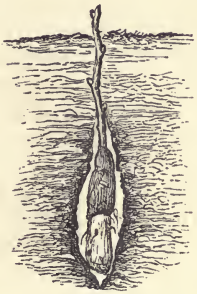

Fig. 238.—*Root-graft, badly set out, or with a cavity below.*

Fig. 239 represents the usual form of the dibble, and Fig. 240 the appearance of the root-graft when ready to be set out.

Fig. 239.

Fig. 240.

The most favorable soils are rich, well pulverized, and rather strong loams. If light or gravelly, there is more danger from midsummer droughts, which often prove quite destructive. Grafting the whole root entire will much lessen the difficulty.

The chief care afterwards is to keep the ground constantly cultivated, and perfectly clean, which will increase the growth during summer, and exclude mice in winter; the trees are to be trained up to one leading stem, not trimming so closely as to make them

slender; they are to be kept straight, by tying them when necessary to upright stakes; and all destructive insects must be watched and destroyed.

If the ground is rich and kept perfectly clean, they will grow from one and a half to two feet the first summer after grafting; to three or four feet the second summer; five to six or seven feet the third summer, when many of them will be large enough for removal to the orchard, and most of the remainder in one year more.

Root-grafting is extensively performed in large nurseries; but on unsuitable soils, budding is found the most certain of success, the buds being rarely destroyed, and only by the most unfavorable winters. The bud remaining dormant the first summer, the growth is one year later than on grafted stocks of the same age; but this difference is made up by the more rapid growth of the shoot from the bud, which is usually twice as great as that of a graft on the root. To obtain handsome and good trees, the bud should be set within two or three inches of the ground. Budded trees usually have better roots than root-grafted ones.

PLANTING ORCHARDS.

Soil. The apple is a vigorous and hardy tree, and will grow upon most soils. It does best, however, on those that are deep, rich, and fertile, such as will give good crops of Indian corn. Hard, shallow, and wet grounds are to be avoided. Improvement by manuring and deep cultivation is desirable, as a great difference in quality and productiveness results from a difference in fertility.

Distance. Where the quantity of ground is limited and in rare cases, trees may for a time stand within fifteen or twenty feet; but for large and permanent orchards they should not be nearer than thirty feet. There is, however, a material difference in the size of varieties, hence a variation may be allowed. But this variation in distance should not break the rows which are to be preserved for

convenience in cultivation. The rows may be kept entire, by varying the distance in one way only, as in the annexed figure. The

middle portion is for trees of the largest size, as the Spitzenburgh, Fall Pippin, and Rhode Island Greening; those of smallest size, as Bough, Yellow Harvest, and Sine Qua Non, are on the left; and those of middle growth, as the Swaar, Black Gilliflower, and Tallman Sweeting, are on the right.

This distinction in the size of the trees is only necessary in the most extensive orchards.

Transplanting. Full directions have been given in a preceding chapter, where the superior advantages of broad, deep, and loose beds of earth, made by heavy subsoiling and manuring, have been pointed out; or in the absence of this excellent preparation, by digging large holes to be filled with rich mould, or manured surface-soil.

CULTIVATION.

The importance of thorough cultivation has been already noticed, and cannot be too well understood. If two specimens could be exhibited side by side, the one showing the stunted, lingering, mice-eaten, and moss-covered trees, caused by neglect; and the other, the vigorous and thrifty growth, and the fair and abundant crops, resulting from fine and clean culture; none could fail to be satisfied of the superiority of the one and impolicy of the other.

RENOVATING AND PRUNING OLD ORCHARDS.

As soon as the first symptom of failure in old orchards appears, they should, in addition to good cultivation, be freely manured in connexion with the application of lime or leached ashes. The change which may be thus wrought, can hardly be understood by one who has not witnessed the result. The following experiment, similar in nature, but differing in the mode of performance, described by H. W. Rockwell, of Utica, N. Y., cannot fail to be interesting:

"The experiment was performed upon three trees standing in my grounds, none of which were less than *thirty years* old. One of these trees, an old-fashioned [Newtown] Pippin, and a great favorite, had borne moderately; the other two made out between them to 'get up' about a dozen apples a year, just to let me know, I presume, that they 'could do it,' but were perfectly indifferent *how* it was done.

"I last summer undertook the renovation of these trees. For this purpose I opened between them trenches, say ten feet in length,

two feet in depth, and about eight feet equidistant from tree to tree The roots which were encountered in this operation were, of course, all cut off, the trenches filled with *well rotted manure*, and closed. I finished by giving each of the trees about a peck of charcoal mixed with the same quantity of ashes, and now for the result. I have this year gathered from the 'two outcasts' just mentioned, instead of my annual dividend of a dozen apples, from six to eight bushels apiece of as handsome fruit as you ever saw, with about the same proportion from the third, which has always been a moderate bearer."

Bearing orchards commonly lose their vigor, and give small and poor fruit, when allowed to grow in grass-land, without any cultivation. If the soil is naturally rich, a shallow ploughing and an occasional harrowing will restore their vigor. Or if ploughing cannot conveniently be given, they may be much improved by being converted to pasture for sheep, adding occasionally a top-dressing of manure in autumn. These animals will serve in part to enrich the land, keep the grass grazed short, and pick up the prematurely fallen fruit, infested with worms or insects.

The amount of cultivation or top-dressing to be given to such orchards must be determined by the annual growth of the shoots. If less than a foot in length, more vigor must be imparted to them. If more than a foot and a half, they are quite thrifty enough.

Pruning. The mode of treating large trees has been already adverted to in the chapter on pruning. There are some owners of orchards who most erroneously suppose that when trees become

Fig. 241.

old, heavy pruning will restore their vigor in the absence of good

cultivation; while the correct mode of treatment is, very moderate and gradual pruning, in connexion with the best of cultivation. The foregoing correct portraits of actually existing specimens of bad pruning, unhappily have too many originals over the country (Fig. 241). This most unsightly mode of trimming is often adopted when a removal of the top by grafting is intended.

Grafting New Tops on Old Trees. It often happens that fruit on large trees is worthless, and it becomes an important object to change the top by grafting or budding it with some better variety. In this case, instead of cutting off large branches and grafting them at once, it is better to prune the top in part, as shown by Fig. 242, which will cause an emission of vigorous shoots. These are then budded or grafted with ease and success. And, as the grafts gradually extend by growth, the remainder of the top may, by successive excisions, be entirely removed. Where trees are not too old, and the ground is kept cultivated, good-sized trees are thus obtained much sooner than by setting out young ones.

Fig. 242.

To give a well shaped head to such newly formed trees, and to prevent the branches from shooting upwards in a close body near the centre of the tree, the old horizontal boughs should be allowed to extend to a distance in each direction, while the upright ones should be lopped. This is distinctly exhibited in Fig. 242.

The following judicious mode of renewing the old tops of trees formerly regarded as worthless, was given by the late George Olmsted, of Hartford, Ct., in the Horticulturist:

"These trees I commenced grafting six years ago last spring. *I began on the top, and grafted one-third of the tree each year.* It therefore required three years to complete the entire heads of the trees.

"I like this method better than any I have ever tried for grafting large trees, as it gives the grafts a good opportunity to get well started. Cutting off and grafting the top first, gives the grafts there the best possible chance, while the necessary reduction of the top throws the sap into the remaining side branches, which fits them well for grafting the following year; and the third year, the lowest branches being made ready in the same way, may be grafted successfully

By this mode, it will be seen that when the grafts are put in on the side branches, they are not shaded by the heavy shoots above them, and they have an unusual supply of nourishment to carry them forward. Those who have attempted to graft the whole head of a large tree at once are best aware of the great difficulty in the common mode of getting the grafts to take on the *side limbs*.

"One of these large trees so treated, is probably more than seventy-five years old, and has now an entirely new and vigorous head, grafted with this excellent variety. When I began with it, the fruit was only fit for cider, and it was questionable whether the tree should not be cut down. By grafting it in this manner, I have added surprisingly to its value. Two years ago (the bearing year), I obtained from it ten bushels of apples; last year eight bushels; and this year (only six years from the time I began to graft it), I gathered twenty-eight and a half bushels of excellent fruit!

"I consider this tree now worth one hundred dollars; the cost of grafting it was about five dollars; and the latter was all repaid two years ago—the first season the grafts bore fruit."

The bearing year of apple-trees which yield excessive crops, is only every alternate year; but by thinning out a large portion of the fruit while yet small, the exhaustion will not be so great as to render the tree barren the second season, and it will bear annually. By picking off all the young fruit, the bearing year may be entirely changed, or one bough may be made to bear one year, and another bough the second year.

Depredators. The insect enemies of the apple have been already described. Mice, which sometimes girdle and destroy young trees, especially such as are neglected and allowed to grow in grass, may be excluded by a small mound of earth, thrown up about ten inches high around the stems late in autumn. This earth should be compact and smooth, and not consist of turf, which is liable to cavities, inviting instead of repelling these depredators. Fig. 243 shows the mode of performing this operation. If well done, it has never failed to protect the trees. One man will go over some hundreds in a day. In the following spring this earth is again levelled.

Fig. 243.—*Mode of banking up trees to protect from mice.*

Rabbits are excluded by placing peeled bark or stiff painted paper around the stems: or, easier, by rubbing fresh blood upon the bark every few weeks during winter, which may be done by using a piece of fresh liver for this purpose.

CHANGES WROUGHT BY CLIMATE AND SOIL.

This subject has been treated, as applied to fruits generally, in a former part of this work; a few brief remarks on the variations in the apple may be interesting.

The winter apples of the northern states, when cultivated further south, are changed to autumn apples; and as far south as Georgia, some of our good keepers ripen nearly by the end of summer. The Baldwin and Rhode Island Greening, at Cincinnati and at St. Louis, cease to be winter fruits. There are few or none of the northern apples which succeed well as keepers as far south as Carolina. This is owing to the long southern summers. It has been found that varieties originated in the southern states are generally best adapted to the climate of that region.

Some varieties are greatly influenced by a change of climate, and others but slightly. The Ribston Pippin, so excellent at Montreal, is of little value a few degrees further south. The Rhode Island Greening and the Roxbury Russet, on suitable soils, throughout New York and New England, present the same characteristics of flavor and appearance; the Baldwin, so fine at the east, greatly deteriorates in northern Ohio; and the Belmont, which has been pronounced the most valuable of all apples at Cleveland, is unworthy of cultivation at Cincinnati. These changes, in the latter instances, may perhaps be ascribed to a difference in soil; and the application of special manures, as lime, potash, etc., on those unfavorable soils, has improved the quality. The periods of ripening, given in the following pages, are intended to apply to the northern states. A difference of about two or three weeks exists between fruits cultivated at Boston or Rochester, and in central Ohio and southern Pennsylvania, and other differences of latitude nearly in the same ratio.

DWARF APPLES.

For summer and autumn sorts, dwarf apples are valuable in affording a supply to families. They begin to bear in two or three years from setting out, and at five or six years, if well cultivated, will afford a bushel or so to each tree. A portion of a garden as large as the tenth of an acre, may be planted with forty or fifty trees, without crowding. All the different varieties of the apple may be made Dwarfs by working on the Paradise or Doucain stock—the former are smaller and bear soonest; the latter are larger and ulti-

mately afford the heaviest crops. Among the handsomest growers as dwarfs, are Red Astrachan, Jersey Sweet, Porter, Baldwin, Dyer, Summer Rose, Benoni, and Bough.

VARIETIES.

SYNOPSIS OF ARRANGEMENT.

Division I. SUMMER APPLES.
- Class I. *Sweet Apples.*
  - Section I. Color striped with red.
  - Section II. Color not striped.
- Class II. *With more or less acidity.*
  - Section I. Color striped with red.
  - Section II. Color not striped.

Division II. AUTUMN APPLES.
- Class I. *Sweet Apples.*
  - Section I. Color striped with red.
  - Section II. Color not striped.
- Class II. *With more or less acidity.*
  - Section I. Color striped with red.
  - Section II. Color not striped.

Division III. WINTER APPLES.
- Class I. *Sweet Apples.*
  - Section I. Color striped with red.
  - Section II. Color not striped.
- Class II. *With more or less acidity.*
  - Section I. Color striped with red.
  - Section II. Color not striped.

The characteristics which constitute these divisions and subdivisions, are not in all cases perfectly distinct. Summer apples gradually pass into autumn, and autumn into winter apples. A few, but the number is extremely small, possess nearly a neutral flavor

between a dead sweetness and slight acidity. Again, apples classed with those that are striped, sometimes present a nearly uniform shade of red; and, in rare instances, the brown cheek of a green or yellow variety exhibits faint stripes.

But these may be regarded rather as exceptions to general characters, which are on the whole as clearly defined as any other distinctive points of the different varieties. Controlling circumstances will produce changes in all fruits, and descriptions are not founded on extreme exceptions, but on *average* characteristics.

The SIZE is designated by comparison;—for example, the Swaar and Baldwin are *large;* Herefordshire Pearmain and Tallman Sweeting are *medium;* English Golden Pippin and Lady Apple are *small.* Qualifying terms give a more precise meaning—as the Fall Pippin and Monstrous Pippin, are *very large;* Hawley and Dutch Mignonne, are *quite large;* Bullock's Pippin and Early Strawberry are *rather small;* and the Siberian Crab is *very small.*

DIVISION I.—SUMMER APPLES.

CLASS I.—SWEET APPLES.

Section I.—Striped with red.

Foster. Large, roundish, indistinctly striped pale red on yellow; stalk short, calyx open, basin deep, ribbed, sweet, rich. Aug. Mass. (Hov. Mag.)

Section II.—Not striped.

GOLDEN SWEET. Medium or rather large, roundish, slightly flattened; greenish, becoming pale yellow; stalk an inch or more long, slender; cavity acuminate; basin moderate; flesh very sweet, good, of moderate quality. The fruit is always fair, the tree a free grower, and very productive. Buds large; leaves sharply serrate. Late in summer. Valuable for domestic animals. Tender far west; succeeds well south-west.

HIGHTOP SWEET. (Summer Sweet of Ohio, Sweet June.) Rather small, roundish, regular; skin smooth, light yellow; cavity deep, narrow; calyx small, in a shallow, slightly furrowed basin; flesh yellowish, very sweet, rich. Tree upright, productive. A valuable summer sweet apple at the West.

Manomet. (Manomet Sweeting.) Size medium, roundish; yellow, with a rich cheek; stalk rather slender, cavity shallow; basin shallow, furrowed; flesh tender, sweet, rich. Late summer. Mass.

SWEET BOUGH. (Large Yellow Bough, Early Sweet Bough.) Large, roundish, remotely conical-ovate, sometimes distinctly conical; pale greenish yellow, stalk one-half to an inch long, basin narrow, deep; flesh white, very tender, with an excellent sweet flavor. Ripens from the middle to the end of summer. A moderate and regular bearer. Shoots yellowish, somewhat irregular, ascending; tree round-headed; leaves obtusely crenate.

CLASS II.—WITH MORE OR LESS ACIDITY.

Section I.—Striped with red.

AMERICAN SUMMER PEARMAIN. (Early Summer Pearmain, of *Coxe.*) Medium in size, oblong, slightly inclining to truncate-conical; nearly covered with fine broken streaks and dots of red; stalk nearly one inch long; basin round, even, distinct; very tender, often bursts in falling, sub-acid, flavor fine. Continues to ripen for several weeks in late summer and early autumn. Needs good and rich cultivation. Growth rather slow. This is distinct from the English Summer or Autumn Pearmain, in its larger size, higher red, more oblong form, and superior quality.

Aromatic Carolina. Large, oblate-conic, oblique, pale red with a heavy bloom; flesh tender and melting, flavor aromatic and excellent. July. Tree spreading. An abundant bearer. Southern.

BENONI. Medium in size, roundish, sometimes obscurely conical; deep red on rich yellow, in distinct broken stripes and dots; stalk half an inch long; basin small; flesh yellow, tender, rich, sub-acid, "very good." Late summer. Tree erect, good bearer. Has not succeeded well in all localities. A native of Dedham, Mass.

CAROLINA RED JUNE. (Red June, Blush June.) Size medium, oblong, very red, flesh white, tender, juicy, sub-acid, with a sprightly, agreeable flavor; quite early, and continues to ripen for four weeks, and will keep long after ripe for a summer apple; profitable for market. The tree a fine erect grower, very hardy, bears young and abundantly. The most valuable early apple in northern Illinois and adjacent region. Hardy at the West.

EARLY JOE. Size medium or rather small; oblate, sometimes obscurely approaching conical; smooth and regular; color, with numerous short, broken, red stripes on yellow ground, a nearly uniform deep red to the sun, with conspicuous white specks; stem three-fourths of an inch long, rather thick; cavity shallow, acute; basin small, even; flesh fine grained, very tender, slightly crisp, juicy, sub-acid, spicy, quality "best." Ripens the last two weeks of summer. Shoots dark, growth slow. A profuse bearer. Origin, East Bloomfield, N. Y.

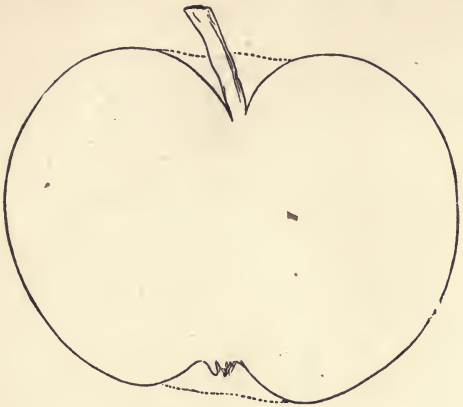

Fig. 244.—*Early Joe.*

Early Pennock. Fruit large, roundish, conical, striped bright red on greenish yellow; stem long; cavity deep; irregular; flesh yellowish white, rather coarse, sub-acid, of rather poor quality. Esteemed at the West for its hardiness and productiveness. Aug. and Sept.

Early Red Margaret. Rather small round-ovate, striped with dull red, somewhat russeted; stalk half an inch long, thick; basin plaited, narrow, very shallow; flesh sub-acid, tender, good when fresh; ripens at wheat harvest, scarcely earlier than Early Harvest. Shoots erect, downy, moderate bearer.

Early Strawberry. (American Red Juneating, of *Manning.*) Rather small, roundish, varying to round-ovate, and sometimes quite conical; surface indistinctly and finely striped with bright and deep red, tinging faintly the flesh; stalk slender, three-quarters to an inch and a half long; basin small and narrow; flesh white, tender, sub-acid, rather brisk, pleasant, not very rich. Ripens one to three weeks later than Yellow Harvest. Growth, very erect; leaves erect, finely crenate. Productive. Good in all localities.

Fourth of July. Above medium, roundish oblate, often slightly conic, striped red on pale yellow, with a white bloom. Flesh yellowish, tender, rather acid, of moderate quality. Ripens very early, productive. Valuable for cooking and profitable for market. Cultivated at the West, of foreign origin.

Foundling. Rather large, oblate-conic, ribbed; striped red on yellowish green; stalk short, slender, cavity large, basin small,

furrowed; flesh yellow, tender, with a rich, sub-acid flavor Mass.

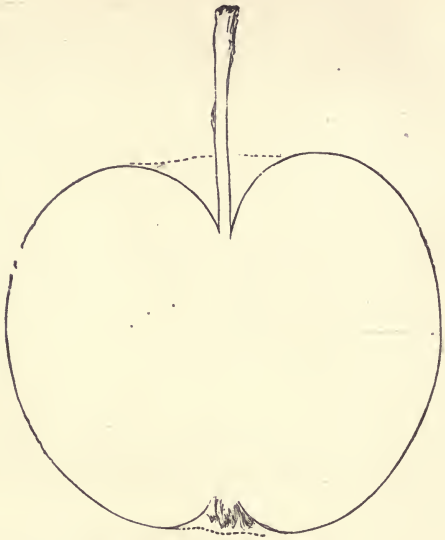

Fig. 245.—*Early Strawberry.*

Garden Royal. Below medium, roundish, slightly flattened at ends, even and regular; surface with small, broken, red stripes on yellow ground, deep red to the sun; stalk short, or half to three-fourths of an inch long, slender, cavity acute; calyx large, open; basin very shallow; flesh yellowish-white, exceedingly tender, and fine grained; flavor mild, sub-acid, fine. A poor grower, but a first-rate dessert fruit. Late summer. Origin, Sudbury, Mass.

Hocking. (Townsend.) Rather large, striped red on yellow; cavity wide; basin shallow, slightly ribbed; flesh fine grained, tender, mild sub-acid. Aug. An upright, vigorous, productive tree. Valued at the West.

Julian. (Julin.) Fruit medium, roundish, conical; calyx small in a narrow basin, stem short in a moderate cavity; striped with fine red on yellowish white; flesh white, tender, and fine flavored. One of the finest summer apples at the South, where it ripens at midsummer.

Klaproth. Size medium, oblate; streaked and stained with red on greenish yellow; stalk short, cavity deep; basin wide, even; flesh

white, crisp, with a pleasant sub-acid flavor. Tree a strong grower and great bearer. Fruit bears carriage well and promises to become a good market sort. Lancaster co., Penn. Aug. to Oct.

SOPS OF WINE. Medium size, round-ovate, dark red; stalk long, slender; flesh white, often stained red, moderately juicy, sub-acid, of good flavor. Valuable for its free growth and fair fruit. Late summer. The *Sapson* is smaller, firmer in flesh, and less valuable.

Summer Hagloe. Size medium, roundish-oblate; streaked with bright red on yellow ground; stalk rather short and thick; flesh very soft, rich, of fine quality. Ripens at the end of summer—an excellent culinary variety. Shoots dark, strong, thick; terminal buds very large.

This is wholly distinct from the *Hagloe Crab*, a late, small, ill-shaped, ovate fruit, cultivated only for cider.

Summer Queen. Rather large, roundish-conical, somewhat ribbed; striped with bright red on rich yellow ground; stalk an inch and a half long; cavity small, acute; basin small, furrowed; flesh yellowish, rather acid, spicy, very rich. Fine for cooking. Late summer. Good on warm, sandy soils, poor on cold clay. Shoots light colored, leaves finely crenate. Hardy far west.

SUMMER ROSE. (Woolman's Early, Lippincott's Early, Woolman's Striped Harvest.) Medium or rather small, roundish-oblate; yel-

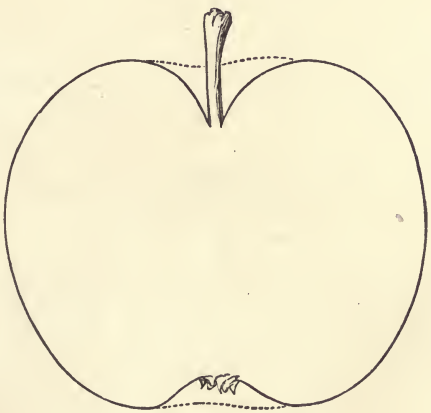

Fig. 246.—*Summer Rose.*

iowish, blotched, and streaked with red; stalk rather short; basin round, slightly plaited; flesh very tender, slightly crisp, texture

fine, mild sub-acid, juicy, excellent. Begins to ripen with wheat harvest, and continues a month. Better in quality for the table than Early Harvest, but less productive, and too small for general value.

WILLIAMS' FAVORITE. (Williams, Williams' Red, Williams' Favorite Red.) Size medium, sometimes rather large; oblong-ovate, remotely conical, very smooth; color mostly fine dark crimson stripes; stalk three-quarters to one inch long, enlarged at insertion, cavity shallow; basin small and shallow, even, or somewhat ribbed; flesh yellowish white, moderately juicy, with sometimes a

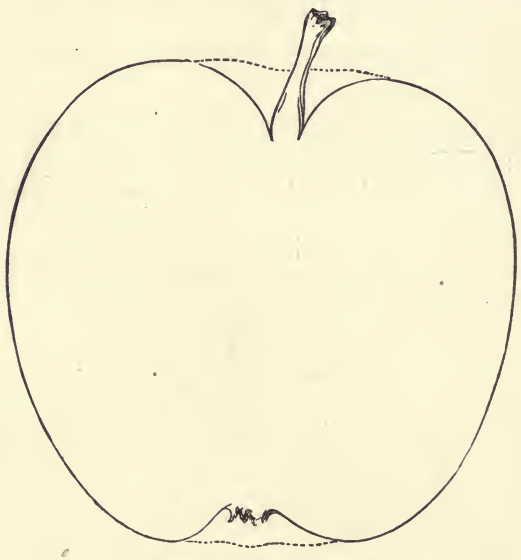

Fig. 247.—*Williams' Favorite.*

tinge of red near the surface, mild, agreeable, fine. Ripens for several weeks late in summer. Its handsome appearance has partly contributed to its high reputation. Requires a rich soil and good cultivation. Origin, Roxbury, Mass.

Section II.—Not striped.

Cole's Quince. Large, oblate, conical, ribbed, yellow; mellow when ripe, mild, rich, high quince flavor. Cooks well before ripe. Productive. New England. Hardy far west.

EARLY HARVEST. (Yellow Harvest, Prince's Harvest, Early French Reinette, July Pippin.) Size medium, roundish, usually more or less oblate, smooth; bright straw color, when ripe; stalk rather short and slender; calyx moderately sunk; flesh nearly white, flavor rather acid, fine. Ripens at wheat harvest, and for

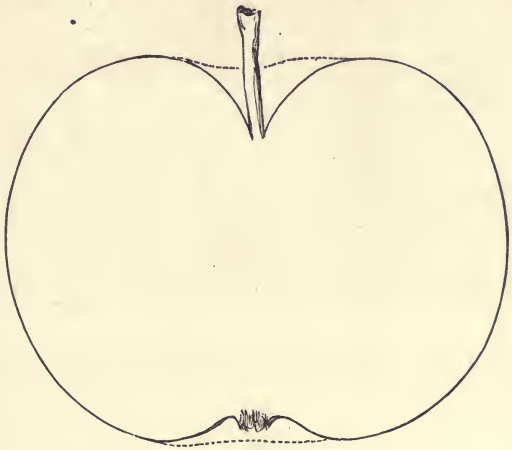

Fig. 248.—*Early Harvest.*

three weeks afterwards. Shoots erect, slightly diverging, straight, often forked. Productive. Needs rich cultivation to be fine. Good throughout the northern states and south-west, tender north-west.

Garretson's Early. Size medium, roundish-oblate; skin greenish yellow with numerous dots; stalk short, cavity shallow; basin small, furrowed; flesh white, crisp, tender, sub-acid, "very good." July and Aug. Tree vigorous, productive.

Horse. Large, varying from oblate to oval, ribbed, yellow; stalk short; cavity and basin shallow; flesh yellow, rather coarse, sub-acid. Tree vigorous, productive, valued at the South and West as a summer cooking and drying apple.

Kirkbridge White. (Yellow June.) Size medium, oval, tapering to apex and base, equally blunt at ends with broad ribs; smooth, pale yellow; stem short; cavity and basin very narrow; flesh very tender, fine grained, with a moderately "good" sub-acid flavor. Ripens soon after Early Harvest and for six weeks. Tree a slow grower, but a great and early bearer; valuable at the West. Too tender for long transportation.

Lyman's Large Summer. Large, roundish, flattened at ends; pale yellow; sub-acid, high flavored, rather fine in quality. Ripens at the end of summer. Tree a poor bearer until large. Conn.

PRIMATE. Above medium in size, roundish-conical, somewhat ribbed, light green, becoming light yellow, often with a slight blush; fine grained, very juicy, with a very agreeable, mild, sub-acid flavor. Ripens for several weeks through the latter part of summer. Valuable. Western New York.

RED ASTRACHAN. Rather large, sometimes quite large, roundish-oblate, slightly approaching conical, rather smooth; nearly whole surface brilliant deep crimson, with a thick bloom like a plum; stalk one-half to three-fourths of an inch long; calyx in a small slightly uneven basin; flesh white, rather crisp; good, rather acid, slightly austere. A few days after Early Harvest. Excellent for cooking. Shoots stout, dark brown, diverging and ascending; leaves broad. This apple, although of second-rate flavor, is rendered by its earliness and very handsome and fair appearance, by the vigor and productiveness of the tree, and its excellent culinary qualities, worthy of general cultivation. It should be picked a few days before fully mature. Hardy far west.

Sine Qua Non. Size medium, roundish, inclining to conical; smooth, pale greenish yellow, shaded with reddish brown to the

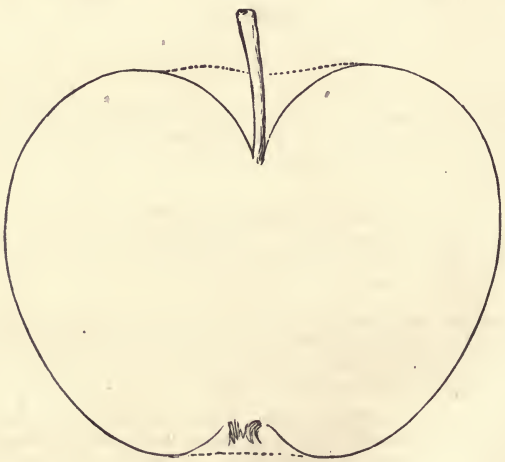

Fig. 249.—*Sine Qua Non.*

sun; stalk quite slender, nearly an inch long; basin smooth or very slightly plaited; flesh greenish white, fine grained, delicate

very tender, moderately juicy, of a fine, agreeable, sub-acid flavor. Shoots greenish yellow, growth slow. Ripens two weeks after Early Harvest. Origin, Long Island.

Summer Pippin. (Sour Bough.) Rather large, oblong, oval, irregular; skin pale yellow, with greenish dots and a crimson blush; stalk variable, deep set; basin abrupt, furrowed; flesh white, tender, with a pleasant sub-acid flavor. End of summer. A regular handsome grower and good bearer. Westchester co., N. Y.

Trenton Early. Size medium, roundish-oblate, ribbed; color yellowish, somewhat marked with green; surface smooth, cavity wide, basin furrowed; flesh light, tender, with a pleasant sub-acid flavor. Late summer. Valued at the West.

White Juneating. Small, round, sometimes slightly oblate, smooth, very regular; pale greenish yellow, or light yellow; very thin russet round the stalk; stalk slender, three quarters of an inch long, set shallow; basin very shallow; tender, sub-acid, not rich, becoming dry. Ripens a little before Yellow Harvest. Growth upright, rather stout. Productive. For cooking only. Old English sort.

The *May apple*, of Virginia, is a fruit similar to or identical in character and quality with the White Juneating, where it ripens about the first of summer, bearing every year. Large quantities are sent to Baltimore for tarts.

Warfield. Medium, very round, fair, with a light blush; tender, pleasant acid; may be used for cooking in July when two-thirds grown. An excellent late summer market apple. Introduced by S. Foster, Muscatine, Iowa.

DIVISION II.—AUTUMN APPLES.

Class I.—Sweet Apples.

Section I.—Striped with red.

Jersey Sweeting. Size medium; round-ovate, often oblong-ovate, somewhat conical; thickly striped with fine red on greenish yellow; stalk one-half to an inch long; cavity rather irregular; basin wrinkled, distinct; flesh whitish, very sweet, juicy and tender, good flavor. Succeeds well in most localities. Early and mid-autumn—immediately follows Golden Sweet. Shoots stout, short jointed; leaves crenate-serrate.

Richmond. Large, roundish-oblate, slightly ribbed; splashed and striped with crimson on yellow ground, with numerous dots; stalk short, cavity large; calyx large, open; basin large, furrowed; flesh white, tender, sweet, rich. Late autumn. Origin, Sandusky, Ohio

Section II.—Not striped.

Autumnal Swaar. (Sweet Swaar.) Large, oblate, sometimes very slightly ribbed; rich yellow; stalk an inch or more long, varying from long and slender, to thick and fleshy at insertion; cavity and basin wide and slightly ribbed; flesh tender, yellowish, not juicy, with a very sweet, spicy, agreeable flavor. Mid-autumn. Growth vigorous, shoots diverging, tree spreading. A large, roundish-conical apple, with a good, mild, sub-acid flavor; is grown under this name at the West.

Autumn Sweet Bough. (Autumn Bough, Fall Bough, Late Bough, Philadelphia Sweet.) Size medium, conical, angular; pale yellow; stalk slender, deep set; basin deep, furrowed; flesh white, tender, with a very good flavor. Early autumn. Tree vigorous and productive.

Haskell Sweet. Large, oblate, regular, greenish, a warm brown cheek; stalk one-half to three-fourths of an inch long, moderately sunk; basin rather deep, nearly even, flesh tinged with yellowish brown, very tender, sweet, good.

Lyman's Pumpkin Sweet. Very large, roundish, ribbed most towards the stalk; pale green; stalk short; calyx small, basin abrupt; flesh white, sweet, tender, not juicy, of moderate quality. Ripens through autumn, into winter. A valuable culinary sort.

Munson Sweet. Size medium, oblate, smooth, and regular; pale yellow, with a brown blush; stalk short, in a broad cavity; calyx in small basin; flesh yellowish white, tender, with a very good, sweet flavor. Tree a strong grower and uniform bearer. Last half of autumn. A valuable sweet apple.

Pumpkin Russet. (Sweet Russet.) Large, round, slightly flattened, yellowish green, partly russeted; cavity wide, shallow; basin small; flavor rich and sweet. Through autumn. Distinct from the Sweet Russet cultivated through western New York, which is a more conical fruit.

Summer Sweet Paradise. Large, roundish, sometimes remotely oblong, and slightly flattened at the ends, regular, pale green; stalk rather thick, three-quarters of an inch long; basin large, distinct; flesh tender, sweet, rich, aromatic. Ripens first of autumn. Shoots spreading, leaves sharply serrate. Origin, Penn.

This is totally distinct from the Dwarf Paradise, used for stocks, which bears a small, poor, sweet, summer fruit.

Tifft Sweeting. Medium in size, flat, greenish yellow, with russet network, and a warm, light brown cheek; stalk one inch long, cavity wide, obtuse; flesh yellowish, rich, sweet, fine in flavor. A light bearer. New England.

Class II.—With more or less Acidity.

Section I.—Striped with red.

Alexander. Very large, conical, flattened at base, regular; streaked with bright red on greenish yellow; stalk small, cavity rather deep; calyx large, basin deep, even; flesh rather crisp, sub-acid; a coarse sort, only for cooking. A moderate or poor bearer. Late autumn. Very showy, its only recommendation. Russian.

Beauty of Kent. Very large, roundish, somewhat flattish-conical, fair, smooth, and rather obtuse; nearly the whole surface striped with rich purplish red; stalk three-fourths to an inch and a half long, slender, cavity acuminate; calyx small, basin deep, narrow; flesh tender, slightly sub-acid, of rather poor flavor. One of the most beautiful and magnificent in appearance of all apples, but of little or no value, except for cooking. Late autumn. Growth strong and upright, shoots dark. English.

Bonum. Large, oblate, red; basin and cavity shallow; stem medial length; flesh yellow, sub-acid, rich, delicious. An early and abundant bearer. North Carolina.

Buckingham.—(Bachelor, Equinetely, Fall Queen of Kentucky, Kentucky Queen.) Medium to large, oblate, inclining to conic, striped, shaded and splashed with crimson on greenish yellow, with many light brown dots; cavity large, stalk short; basin wide and deep, somewhat furrowed; flesh yellowish, tender, breaking, mild sub-acid, very good in quality. Late autumn and early winter. A popular and profitable sort in the south-western States. Tree hardy and healthy, and moderately productive, forming a round-headed top.

Carnation. W. N. White, of Ga., gives the following description of this apple:—Medium size; a delicious, sub-acid apple, fully first rate; dark red, splashed with russet; flesh white, brittle, and very juicy; both stalk and calyx are sunk in deep depressions; no autumn apple is superior. Ripe Aug. 10th.

Clyde Beauty. Large, roundish-conical, slightly ribbed, striped and mottled red on greenish yellow; stem short, slender, deep set, basin furrowed; flesh white, fine grained, sub-acid. Late autumn. Wayne co., N. Y.

Chenango Strawberry. (Frank, Buckley, Jackson, Sherwood's Favorite, Strawberry.) Rather large, oblong-conic, angular; striped and splashed with light crimson on whitish yellow ground; cavity narrow and deep; basin narrow; flesh white, very tender, with a pleasant, mild, sub-acid flavor. Sept., Oct. Growth upright, vigorous, shoots light colored. Origin, Chenango co., N. Y.

Cooper. Rather large, round oblate, sides unequal, greenish yellow

and pale red; stalk slender, deep set; basin deep; flesh crisp, juicy, pleasant, but not very high flavor. Mid-autumn. Cultivated in Central Ohio.

Cornell's Fancy. Rather large, oblong conic; shaded and splashed red on yellow; stalk medium, cavity large; basin abrupt, furrowed; flesh white, tender, with a pleasant sub-acid flavor. Sept. Cultivated and valued in Central Penn.

Doctor. (De Witt.) Medium in size, or large; regular, oblate; yellow, clouded and streaked with red; stalk and calyx deep set; flesh breaking, tender, aromatic, brisk, fine flavor. Late autumn and early winter. Succeeds well in Pennsylvania and Ohio; less esteemed further north. Origin, Pennsylvania.

Duchess of Oldenburgh. Medium or rather large, roundish, a little flattened at the ends; light red in broad broken stripes and splashes on yellow ground; stem short, in an acuminate cavity; basin deep and narrow; flesh yellowish white, sub-acid, very handsome. Good for cooking. Early autumn. Shoots dark, ascending. Very hardy. Succeeds well at the West and North. The strong growth of the tree, its early bearing and endurance of severe winters, and the fair and handsome appearance of the fruit, render it one of the most valuable sorts for the West.

Fairbanks. Size medium, rather oblate, inclining to conic; skin light yellow, striped with red, with patches of russet; stem long, set in a broad and shallow cavity; flesh yellowish, juicy, with a rich sub-acid and vinous flavor. September and October. Origin, Winthrop, Maine.

Fall Seek-no-further. Very large, oblate; shaded and striped with red on yellow; stalk long; cavity large, russetted; basin broad, uneven; flesh whitish, tender, pleasant, sub-acid. Productive. Conn.

Fall Wine. Medium to large, roundish-oblate; color a rich red, faintly striped on a rich yellow skin; stem slender; flesh yellow, crisp, tender, juicy, with a mild, rich, scarcely sub-acid flavor. Mid-autumn till winter. Succeeds best in the West—often scabby at the East.

Fameuse. (Snow-apple, Pomme de Neige.) Medium in size, round, often oblate, even; handsomely striped and blotched with fine deep red on whitish ground—where much exposed, a deep, nearly uniform red; stalk three-fourths of an inch long, slender; cavity small; basin quite small, slightly wrinkled; flesh very white, juicy, sub-acid, a little spicy, exceedingly pleasant, but not very rich. Late autumn. Shoots dark, diverging, somewhat flexuous. Much admired as a table fruit for its handsome appearance and pleasant, refreshing flavor.

Gabriel. Size medium, roundish-ovate, regular; striped and splashed with pale red on yellow; stalk slender; calyx and basin small; flesh yellowish, sub-acid, of excellent flavor.

GRAVENSTEIN. Rather large, roundish, slightly oblate, obtusely and obscurely ribbed, surface a little wavy; striped and splashed with bright red on a yellow ground; stalk three-quarters of an inch long; cavity rather deep; calyx large; basin deep, narrow; flesh tender, juicy, very rich, sub-acid or rather acid, high flavored. Mid-autumn. Productive, handsome, and excellent. Fine in all localities. Shoots strong, becoming smooth and shining, ascending. German.

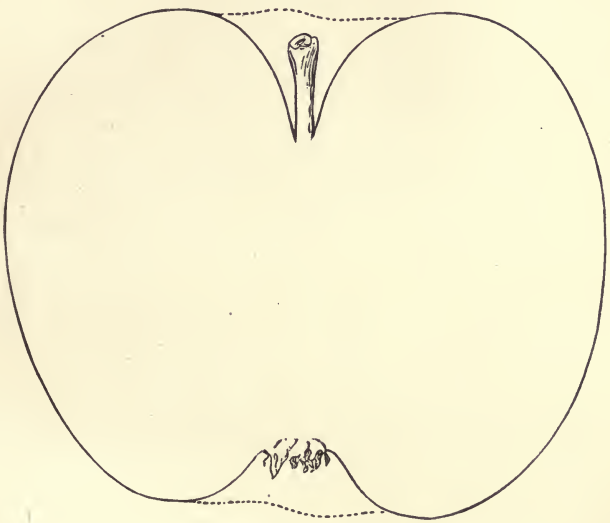

Fig. 250.—*Gravenstein.*

Hurlbut. Size medium, oblate, conic; yellow striped with red; stalk small; cavity large; basin shallow; flesh white, crisp, tender, with a mild sub-acid flavor. Conn.

Jefferson County. Medium, roundish, regular; striped and shaded red on yellow; cavity deep; calyx small; basin deep, smooth; flesh crisp, tender, with a very good mild sub-acid flavor. Late autumn. Tree vigorous, productive. Jefferson co., N. Y.

Jeffries. Medium or rather large; round oblate; yellow, red, and deep red, striped; stalk very short, slender; cavity and basin

deep; flesh yellowish white, remarkably tender and juicy; flavor very pleasant. Ripens first of autumn. Origin, West-Chester, Penn. Hardy far north.

Jewett's Red. (Jewett's Fine Red, Nodhead.) Medium or rather large, roundish, slightly oblate; striped red on yellow or slightly greenish yellow ground, with conspicuous white dots; stem nearly an inch long; cavity acuminate; basin rather shallow; flesh remarkably tender, fine grained, mild sub-acid, slightly aromatic. Mid-autumn into winter. Cultivated in the northern parts of New England. Hardy at the West.

Kane. (Cane, Cain.) Size medium, roundish-oblate, often obscurely conical, regular; surface fair and beautiful, highly polished, indistinctly striped with brilliant light crimson, gradually merging into delicate blush color on the shaded part; stalk often very short; cavity acute, narrow; basin regular; flesh yellowish white, with a pleasant, good flavor. Hardly of the highest quality, but much admired for its beauty. Late autumn. A native of Kent co., Delaware.

LATE STRAWBERRY. (Strawberry, Autumn Strawberry.) Size medium; roundish, slightly conical, sometimes faintly ribbed; nearly whole surface with small broken streaks of light and dark red; stalk slender, about an inch long; basin ribbed; flesh yellowish white, slightly fibrous, very tender and juicy, with a fine, very agreeable, sub-acid flavor. Young trees of remarkably thrifty growth, leaves sharply serrate, which at once distinguishes them from the crenate leaves of the Early Strawberry. Ripens early in autumn, and often keeps till winter. Very productive. One of the best early autumn apples. Succeeds well in the West.

Leland Spice. (Leland Pippin.) Large, roundish, obscurely conical, slightly ribbed; whole surface with brilliant red streaks on yellow ground, dotted with yellow; stalk half an inch long; cavity and basin ribbed; flesh yellowish white, sub-acid, spicy, rich, fine. October. Origin, Sherburne, Mass.

Long Island Seek-no-further. Large, oblate, conical; skin yellow, striped and splashed with red; flesh tender, with a good sub-acid flavor. Oct. to Feb. An old variety. Tree productive. Origin unknown.

Lyscom. Large, round, with broad, broken, distinct, pale red stripes, on yellowish or greenish yellow ground; stalk three-fourths of an inch long, slender; calyx deep set; flesh fine grained, mild, slightly sub-acid, moderately rich, good flavor. Middle and late autumn. Mass.

Magnolia. Size medium, oblate-conical; striped and mottled with crimson on yellow; stalk short; cavity broad, uneven; basin small; flesh white, tender, with a brisk aromatic flavor. Growth moderate, productive. Mid-autumn.

Mangum. Medium, oblate, slightly conic, ribbed; shaded and striped with red on yellow with numerous dots; stalk small, in a broad, russeted cavity; basin slightly furrowed; flesh yellow, very tender, with a mild sub-acid excellent flavor. A valuable Southern apple. Tree thrifty, productive.

Melon. (Watermelon, Norton's Melon.) Medium or large, roundish, often slightly conical, frequently a little irregular; color, with stripes and dots of bright red on yellow ground, or clear red on pale yellow; stalk an inch long, slender; cavity acuminate; basin deep; flesh white, tender, very juicy, fresh, and pleasant, spicy, sub-acid or slightly sub-acid, fine flavored. Growth rather slow. Late autumn and early winter, but often keeps longer. An excellent table apple, but a moderate bearer. Origin, East Bloomfield, N. Y.

Melt in the Mouth. Medium or rather small, roundish, slightly flattened; skin greenish yellow, indistinctly striped and shaded with red, with russet dots; stalk short; cavity shallow, obtuse; calyx open; flesh yellow, with a rich, aromatic, rather acid, and very good flavor. Ripens through autumn. Penn.

Mexico. Size medium, roundish; striped light and dark red; stalk large and long; cavity broad, shallow, russeted; calyx large, in a narrow basin; flesh whitish stained with red, tender, with a very good flavor. A handsome New England fruit. Tree very hardy, productive.

Myer's Nonpareil. (Ohio Nonpareil.) Large, roundish, slightly oblate; marbled and splashed red on yellow; cavity and basin medium; flesh yellowish white, with an excellent sub-acid flavor. Autumn. Growth strong and straight, forming a compact head. Productive, and much valued at the West.

Orndorf. Size medium, roundish; slightly striped and shaded red on yellow; stalk slender; cavity and basin deep; calyx open; flesh yellowish, crisp, with an excellent sub-acid flavor. A moderate bearer. Oct. and Nov. Ohio.

Rambo. (Romanite of N. J.) Size medium, oblate, smooth; streaked and marbled with dull yellowish red on pale yellowish ground; dots large; whitish; stalk an inch long, rather slender; basin broad, slightly plaited; flesh tender, rich, mild sub-acid, fine flavored, often excellent. Fine in nearly all localities. Late autumn and early winter. Known by the erroneous name of Seek-no-further in Philadelphia market. Tender far west.

Republican Pippin. Large, round-oblate; striped with red on a mottled reddish ground, greenish yellow in the shade; stalk an inch long, slender; cavity sometimes with radiating russet rays; flesh tender, sub-acid, with a pleasant, peculiar, somewhat walnut flavor. Ripens early and mid-autumn, but is a good cooking apple in summer. Excellent for drying. Tree a strong and

crooked grower—moderate bearer. Origin, Lycoming county, Penn.

Ribston Pippin. Medium or rather large, roundish conical; clouded and striped with yellowish red, on a yellow and slightly russeted ground; stalk slender, often short; cavity rather wide; basin narrow, angular; flesh yellow, crisp, granular, juicy, with a very rich and rather sharp or acid flavor. First-rate as far north as Maine, often second-rate further south; but its quality is usually suffered to deteriorate needlessly by remaining too long on the tree. Late autumn and early winter. Shoots diverging or spreading; buds and young shoots rather hoary. English.

Richards' Graft. (Derrick's Graft, Red Spitzenburgh.) Rather large, roundish-oblate; striped red on yellow; cavity large; basin deep; flesh fine grained, tender, with a refreshing, sub-acid, very good flavor. Sept. and Oct. Cultivated on the Hudson river.

Shiawasse Beauty. Medium, oblate, regular, smooth; deep brilliant red on greenish yellow ground; stalk very short, deeply sunk; basin small, regular; flesh white, tender, crisp, sub-acid and aromatic. Oct. and Nov. Resembles Fameuse, but tree a stronger and more upright grower.

Smokehouse. Medium or rather large, oblate, regular; mottled, and indistinctly striped with red on yellow ground; a slight greenish cast at the crown; stalk one inch long, slender, cavity wide, acute; basin rather distinct; flesh yellowish white, rich, aromatic, fine sub-acid flavor. Mid-autumn to winter. Origin, Chester co., Penn. Succeeds in the Middle States.

St. Lawrence. (Corse's St. Lawrence.) Large, roundish, slightly oblate, and sometimes a little conical, obtuse, whole surface broadly and very distinctly striped with very dark red, on light greenish yellow ground; stem rather short and slender, cavity wide; basin round, deep, with a very obtuse rim; flavor rather acid, moderately rich, agreeable. A very handsome and productive apple, of good second-rate flavor, ripening about mid-autumn. Canadian.

Twenty Ounce. (Cayuga Red Streak, Twenty Ounce Pippin, erroneously.) Very large, roundish, remotely conical, surface sometimes smooth, often very wavy; color striped rich yellowish red on greenish yellow or yellowish white ground; stalk three-fourths inch long; sub-acid, rather coarse, second quality. Very showy, fair, and productive. A profitable market sort. Late autumn and early winter. Growth in large trees becoming straggling. Western New York. The Twenty Ounce Pippin is a large, green, third-rate fruit.

Vandevere Pippin. (Watson's Vandevere, Indiana Vandevere.) Large, oblate, remotely conic, striped and blotched with light red

on yellow; stalk short, cavity large; flesh greenish yellow, firm, crisp, brisk sub-acid. Culinary. Western. Nov. and Dec.

Washington Strawberry. Rather large, roundish-conic, slightly oblate; striped and splashed with deep crimson on yellow; cavity deep; flesh yellow, a little coarse, rich, brisk, sub-acid. Growth vigorous. Sept., Oct. Origin, Washington co., N. Y.

Section II.—Not striped.

Bailey's Spice. Fruit medium, roundish-conic, light yellow with a faint blush; stalk large, deeply set; calyx closed, basin moderate; flesh fine grained, tender, spicy, rich, sub-acid. Mid-autumn. Origin, Plattsburgh, N. Y.

Capron's Pleasant. Rather large, roundish-oblate, greenish yellow; stem rather stout, calyx large, cavity and basin medium; flesh yellow, tender, mild, sub-acid, agreeable. Sept. and Oct.

Cracking. Large, roundish, light yellow, with a tinge of red in the sun; stalk slender, in a deep, narrow, acuminate cavity; basin deep and narrow; flesh a little coarse, yellow, with a pleasant breaking texture, and a very good sub-acid flavor. Valuable at the West.

Disharoon. Rather large, roundish-oblate, slightly conical, yellowish green; stalk short, cavity large, calyx small, basin rather deep and narrow; flesh white, with a fine sub-acid, aromatic flavor, resembling that of Newtown Pippin. Nov., Dec. Ga.

Drap d'Or or "*Cloth of Gold.*" Large, roundish, sometimes slightly oblong-conical, more frequently rather oblate; bright yellow, with numerous black specks; stalk short; basin shallow, plaited; sub-acid, mild, agreeable. Early autumn, extending to mid-autumn. Tree regular, spreading; leaves doubly serrate.

Duckett. Rather large, roundish-oblate, light greenish yellow, slightly ribbed; stalk short, deep set; basin deep; flesh fine grained, mild, sub-acid. Late autumn. A good southern fruit.

DYER. (Pomme Royal, which is the original name.) Rather large, roundish, often approaching round oblong, sometimes slightly flattened, obscurely ribbed; light yellow, rarely a faint brown cheek, and sometimes a slight russet network over the skin; stalk three-fourths to one inch long; basin often deep and large, ribbed; flesh very fine grained, tender, very juicy, with a rich, sub-acid, or rather acid, excellent flavor, having but few equals. Season variable; Nov., Dec. Productiveness variable. An early bearer.

Ernst's Pippin. Large, oblate, smooth; pale greenish yellow, with a brownish cheek; cavity wide, basin wrinkled; calyx open; flesh tender, sub-acid, very agreeable. Mid-autumn. Cincinnati.

Esten. Large, oblong-ovate, slightly ribbed, smooth; yellow, sometimes a blush; dots large, green and red; stalk one inch long, slender; cavity very deep; basin shallow; flesh white, fine

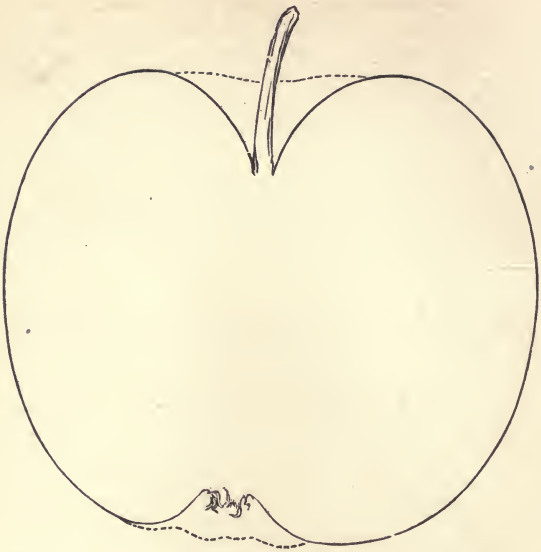

Fig. 251.—*Dyer.*

grained, mild sub-acid. Tree vigorous, very productive. Rhode Island.

Holland Pippin. Very large, roundish, somewhat oblong, and flattened at the ends, sometimes slightly oblate; greenish yellow, becoming pale yellow or whitish yellow, with a brownish red cheek; stalk variable in length, usually short, cavity wide, acute; basin slightly plaited; flesh nearly white, rather acid, with a moderate flavor. Ripens early and mid-autumn, but is a good cooking apple some weeks previously. Wholly distinct from the Fall Pippin. An excellent culinary sort.

Hunge. Rather large, ronndish, somewhat irregular and oblique; skin smooth bright yellow, with a faint delicate blush; stem half an inch long; basin rather deep, slightly ribbed; flesh fine grained, tender, sub-acid, "very good." Much cultivated in North Carolina. Sept. and Oct.

Keswick Codlin. Rather large, somewhat conical, and ribbed; greenish yellow, becoming light yellow; stalk short, deep set; calyx rather large; juicy, pleasant acid, quality moderate. Succeeds well at the West. Fine for cooking; very productive, bears early. Ripens in Sept., but may be used for cooking in summer.

Lowell. (Orange, Tallow Apple, Tallow Pippin, Queen Anne, of Northern Ohio.) Large, roundish-oblong, obtuse, slightly conical; green, becoming rich yellow; surface slightly oily; stalk one

inch long, basin deep, furrowed or plaited inside, rim obtuse, even; flesh yellowish white, rather coarse, rich sub-acid, or rather acid, hardly first quality, but valuable for its fair surface and great and early productiveness. Early autumn. Tree rather slender and a moderate grower.

MAIDEN'S BLUSH. Rather large, oblate, smooth, and regular, with a fine, evenly shaded red cheek or blush on a clear pale yellow ground; stalk short; cavity rather wide; basin moderate, even; flesh white, fine grained, tender, pleasant sub-acid, but not rich. Mid-autumn. Tree spreading. Although deficient in richness, it is valued for its fair, tender, and beautiful fruit, and uniform productiveness. Valuable at the West.

Fall Harvey. Large, roundish-oblate, nearly regular; pale yellow; stalk slender, one inch long, cavity moderate; basin medium in size, furrowed; flesh fine grained, juicy, good, mild sub-acid flavor. Moderate or poor bearer. Essex co., Mass.

FALL ORANGE. (Holden Pippin.) Large, roundish-ovate, or oval; light greenish yellow, becoming pale yellow; rarely a brown cheek; stalk half an inch long, cavity narrow; basin even-rimmed, slightly plaited; sub-acid, tender, good, best when fresh from the tree. Shoots very stout, dark colored. Tree very hardy, bears while very young, fruit always fair.

FALL PIPPIN. (Holland Pippin, erroneously.) Very large, roundish, obtuse, somewhat oblong-conical, a little flattened at the ends, sometimes with large obtuse ribs; color greenish, becoming a high rich yellow when ripe, with some large shades of green about the crown before fully ripe; stalk large, in an acuminate cavity, basin deep; flesh yellowish, rather firm, becoming tender, rich, aromatic, excellent. Leaves sharply serrate, shoots vigorous, rather dark, diverging, becoming spreading; tree large. Late autumn, keeping into mid-winter. Mostly a moderate bearer—fruit sometimes water-cored. Excellent for cooking. Fine in nearly all localities.

Hawley. (Dowse.) Quite large, roundish, slightly conical, sometimes nearly round, with a broad obtuse apex, and slightly flattened; smooth; pale green becoming yellow, sometimes a very faint orange cheek; stalk one-half to one inch long, slender; cavity wide, deep, acute, sometimes slightly obtuse; basin deep, slightly furrowed; flesh yellowish white, fine grained, quite tender, with a mild, rich, sub-acid, fine flavor. Ripens at mid-autumn. Shoots of rather slow growth. Origin, Columbia co., N. Y. Liability to dry rot and water-core has rendered it of little value.

PORTER. Above medium, oblong-ovate-conical, regular, often ribbed at apex; bright yellow, sometimes a dull blush in the sun; stalk one inch long, slender, cavity rather small; basin narrow;

flesh tender, rich, rather acid, of fine flavor. Fair and productive. Early autumn. Succeeds in the Northern and Middle

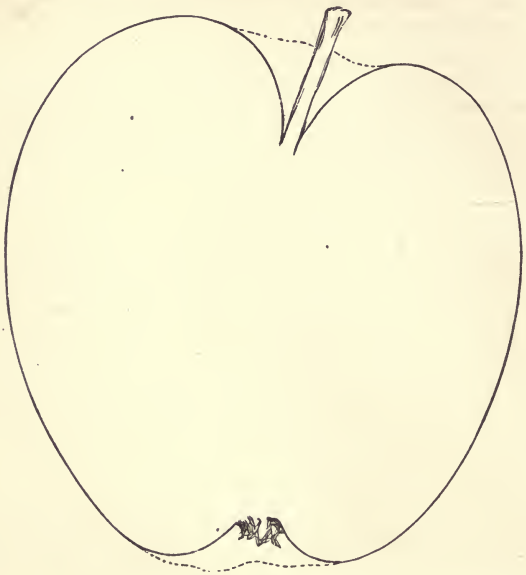

Fig. 252.—*Porter.*

States. Leaves sharp serrate. In some localities this fruit proves too acid for the table.

Roberson's White. Medium, oblong, flattened at ends, green, with dark dots; flesh yellowish, fine grained, crisp, with a sub-acid, aromatic flavor. Late autumn. Tree vigorous, upright. A good bearer. Maryland and Virginia.

Siberian Crab. This is the *Pyrus baccata* of botanists, a distinct species from all our common apples, which are varieties of the *Pyrus malus.* The *common Red Siberian Crab* is very small, a brilliant red on pale yellow. The extreme hardiness of the crab has led to the recent production of many new varieties, varying from an inch and a half to two inches in diameter, a few of excellent quality, and adapted to cold climates. Among the best are, *Marengo*, *Transcendent*, *Montreal Beauty*, *Lady Elgin*, *Hysloþ*, and others. Some years will be required to establish their character among so many, especially as hybrids with the common apple are freely produced. They promise much value for the cold regions of the extreme North.

Winthrop Greening. Large, oblate, remotely conical, slightly ribbed, nearly regular; skin yellow, when ripe, with a little green, sometimes a faint red shade to the sun; stem short, cavity shallow, basin moderate; flesh yellowish white, sub-acid, very good. Mid-autumn. A valued sort in Maine.

DIVISION III.—WINTER APPLES.

Class I.—Sweet Apples.

Section I.—Striped with red.

Bailey Sweet. (Patterson Sweet, Edgerly Sweet.) Large, regular ovate, often slightly and sometimes considerably ribbed; the whole surface frequently a full bright red, in small, broken, indistinct stripes and dots, on light ground; stalk slender, one inch long; cavity small, narrow, slightly ribbed; basin small, plaited; flesh very tender, not juicy; flavor mild, rich, sweet; fine. Early winter. Origin, Perry, Wyoming co., N. Y.

Bentley's Sweet. Rather large, roundish-oblong, striped and blotched with red on yellow ground; stalk in a deep, narrow cavity, calyx large, open; basin deep; flesh rather coarse, firm, of moderate quality. Keeps long. Va.

Hartford Sweeting. (Spencer Sweeting.) Rather large, roundish, slightly flattened; striped with fine red on greenish yellow ground; stalk slender, cavity rather shallow, round; calyx large, basin shallow; juicy, tender, rich, agreeable. Keeps through winter and spring. Productive. Although hardly first-rate in quality, valuable for its productiveness and long keeping. A native of Hartford, Conn.

Hockett's Sweet. Large, roundish oblate, smooth; lightly shaded and obscurely striped with light dull red on a dull rich, yellow skin; flesh yellowish, coarse grained, somewhat crisp, compact, with a very sweet and rather rich flavor. Early winter. North Carolina.

Ladies' Sweeting. Medium, roundish-ovate, apex narrow; striped with red on pale yellow ground, a nearly uniform shade of fine red to the sun; faintly marbled or clouded with white over the red, and cavity faintly rayed with white; stalk short, cavity small; calyx and basin small; tender, juicy, agreeable, fine. Through winter and into spring. A profuse bearer. Growth feeble. Newburgh, N. Y.

Maverack's Sweet. Large, roundish-oblate, approaching conical; striped and shaded with bright red on yellow skin; stalk short, cavity rather large; calyx open; flesh fine grained, tender, of sweet, very good flavor. Early winter. South Carolina.

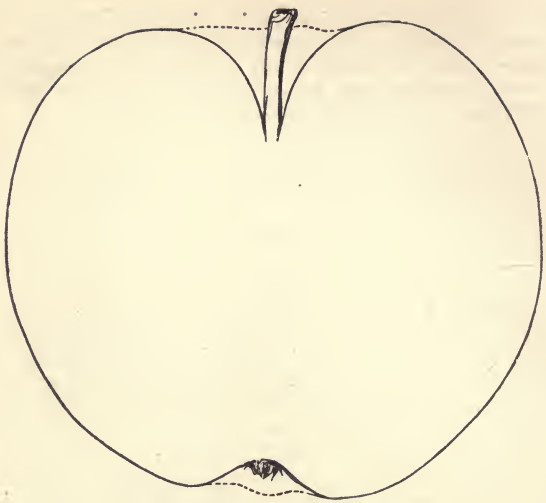

Fig. 253.—*Ladies' Sweeting.*

Phillips' Sweeting. Medium or large, roundish, slightly flattened and conical, regular; mottled red, yellow, and dark red; flesh rich yellow, tender, juicy, crisp, sweet. Very handsome; resembles Ladies' Sweeting, but more showy and not equal in flavor. Early winter. Growth upright, vigorous. Central Ohio.

Ramsdell's Sweeting. (Ramsdell's Red Pumpkin Sweet.) Rather large, oblong, obscurely conical, regular; dark rich red, with a blue bloom; stalk short; basin rather deep, even; flesh yellowish, tender, sweet, rich, good second quality. Tree vigorous, upright, productive. Late autumn and early winter. Conn.

Sweet Pearmain. (Henrick Sweet.) Medium size, roundish or ovate-conical; dark rich red, with rough dots; stalk an inch long, slender, cavity wide, round; calyx woolly, basin very small; flavor sweet and rich. Through winter. Introduced from England before the Revolution. Much valued in Central Ohio and further west.

Sweet Romanite. (Sweet Nonsuch, of Ill.) Size medium, roundish oblate, regular; striped and shaded with bright red on greenish yellow; stalk short; calyx large, open, basin shallow, furrowed; flesh greenish yellow, firm, crisp, juicy, sweet. Keeps through winter. Valuable at the West.

Sweet Vandevere. (Sweet Redstreak, Sweet Harvey.) Size medium, oblong, slightly conical; shaded and striped dull red on greenish

yellow; stalk small, cavity large, irregular; basin wide; flesh tender, juicy, with a rich aromatic flavor. Growth crooked, a profuse bearer. Through winter.

Wing Sweeting. Medium, roundish, slightly oblong, ribbed; color bright red in small stripes and shades on yellow skin; stalk slender, basin and apex very sharply ribbed; flesh whitish yellow, sweet, good. A good bearer, and when well grown on strong soil, a handsome and fine sweet winter apple.

Section II.—Not Striped.

BROADWELL. Rather large, slightly conical, somewhat oblate; skin thin, smooth, greenish yellow; stalk short, small, deep set; flesh white, tender, sweet, juicy, fine—and one of the best winter sweet apples. Keeps through winter late into spring. Ohio.

Camak's Sweet. Size medium, roundish-conical, light green with a warm cheek; stem short or long, cavity narrow; calyx open, basin deep; flesh firm, sweet, very good. A Southern fruit.

DANVERS WINTER SWEET. Medium or rather large, roundish, remotely oblong or conical, obscurely ribbed; greenish yellow, becoming a rather dull rich yellow, sometimes an orange blush; stalk three-quarters to one inch long, cavity acute; basin smooth, narrow; flesh yellow, sweet, rich. Growth vigorous, tree productive.

GREEN SWEET. Large or medium; nearly round, slightly approaching ovate-conical, regular; surface green, with greenish white dots; stalk about an inch long, moderately thick, cavity rather small and narrow, round, acuminate; basin small, slightly furrowed; flesh greenish white, with a very sweet, spicy, good flavor. Fair, productive and a long keeper.

Higby's Sweet. Size medium, roundish, slightly oblate, pale yellow; stalk short; basin deep, slightly furrowed; flesh white, tender, with a good, sweet flavor. Early winter. North-eastern Ohio.

Honey Greening. Large, oblong, oval; greenish yellow with green and grey dots; stalk long, slender, deeply set; basin broad, deep; flesh tender, mild, sweet, slightly aromatic. Grown at the West. Tree vigorous, upright, an early and constant bearer. Nov. and Dec.

Leicester Sweet. (Potter Sweet.) Rather large, oblate, greenish yellow and dull red; tender, rich, excellent, fine for dessert or baking. Winter. Tree vigorous, not very productive. Origin, Leicester, Mass.

London Sweet. (Heicke's Winter Sweet.) Rather large, oblate, pale yellow; stalk very short, deeply set; basin abrupt; flesh whitish, tender, with a fine, sweet, aromatic flavor. Early winter Tree upright, a good annual bearer.

TALLMAN SWEETING. (Tolman's Sweeting.) Medium or rather large, roundish-oblate, slightly conical; clear light yellow, with a clear brownish line from stalk to apex; stalk nearly an inch long; calyx in a distinct, slightly wrinkled basin; flesh white, firm, rich, very sweet. Excellent for winter baking. Keeps into spring. Young tree vigorous, upright, shoots becoming spreading; leaves wavy. Productive. Hardy far west.

Wells' Sweeting. Medium in size, roundish, tapering slightly to base and apex; color light green, with a brownish cheek; stalk short; basin shallow; flesh very white, tender, rich, agreeable. Early winter. Newburgh, N. Y.

Winter Sweet Paradise. Rather large, roundish; skin pale greenish yellow with a brown blush; stalk short; calyx and basin small; flesh white, with a sweet, "very good" flavor. Ripens through winter. Origin, Penn. Succeeds well at the West.

CLASS II.—WITH MORE OR LESS ACIDITY.

Section I.—Striped with red.

Ailes. Large, oblate, striped and shaded red on yellow; stalk short, cavity narrow, basin medium; flesh yellow, crisp, firm, with a rich, sub-acid, "very good" flavor. Keeps through spring. Chester co., Penn.

Baer. Rather small, roundish-oblate, striped red on greenish yellow; stalk long, cavity wide and deep; basin small, plaited; flesh tender, fine grained, pleasant, very good—keeps till spring. Berks co., Penn. Identical with Hiester.

BALDWIN. Rather large, roundish, with more or less of a rounded taper towards the apex; shaded and striped with yellowish red and crimson on yellow ground; stalk three-fourths of an inch long, rather slender; calyx in a narrow, slightly plaited basin; flesh yellowish white, with a rich, sub-acid flavor. Young tree vigorous, upright, shoots dark brown, diverging and ascending. Very productive. Ripens through winter. A first rate winter apple in New England, New York, and Michigan; mostly unsuccessful at the West and South. Too tender, and mostly fails as far north as Maine, unless grafted standard height.

The Baldwin is liable to vary in character; the Late Baldwin appears to be identical, but modified by external causes.

BEN DAVIS. (N. Y. Pippin, Kentucky Streak, Carolina Red Streak, Victoria Red.) Large, roundish-ovate, slightly oblique, regular, smooth, striped red on yellow; stalk long, deep set; basin deep, wrinkled; flesh whitish, tender, with a mild, good, but not rich, sub-acid flavor. Succeeds well at the West, where it proves one of the most profitable winter apples for market; does not mature well at the extreme North. An early and abundant bearer.

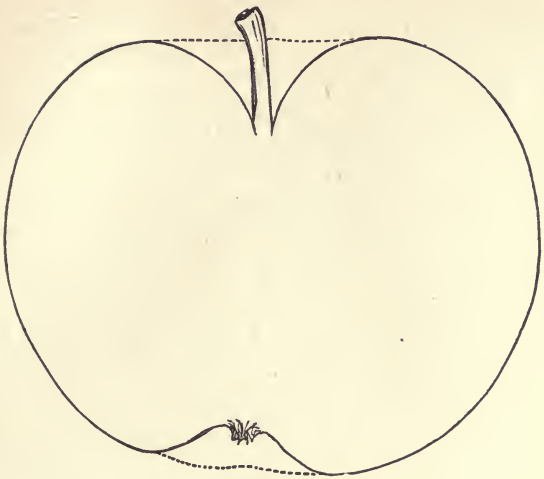

Fig. 254.—*Baldwin.*

Bethlehemite. Medium, roundish-oblate, remotely conical, striped red on yellow; stalk short, deeply set; basin deep; furrowed; flesh yellowish white, tender, with a mild, sub-acid, very agreeable flavor. Ripens through winter. Growth strong, upright. Ohio.

Black Gilliflower. Rather large, oblong-ovate, long conical, regular, obscurely ribbed; surface dark, dull, reddish purple, inclining to greenish yellow where densely shaded; cavity very narrow, acuminate; basin very small, ribbed; flesh greenish white, with a rich, good, slightly sub-acid flavor, becoming dry when ripe. Keeps through winter and late into spring. Shoots dark, rather crooked, fruit always fair; very productive. Rejected by most cultivators on account of its very dry flesh, but a good baking variety. Totally distinct from the Red or Cornish Gilliflower.

Blue Pearmain. Very large, roundish, inclining to oblong, slightly and obtusely conical; dark purplish red in large broken stripes on lighter ground; bloom conspicuous; dots large, indistinct; stalk three-fourths of an inch long; calyx deep set; flesh yellowish, mild sub-acid, good. Early winter. A thin bearer.

Buff. Large, round, oblate, smooth, distinctly striped with light and dark red; cavity broad and deep; basin round, furrowed; flesh white, tender, sub-acid, mild, agreeable, "good," or perhaps "very good," sometimes poor. Much valued at the South.

Bullet. (N. C. Greening, Green Abram.) Rather small, roundish;

striped with light and dark red on greenish yellow; stalk short, often with a lip at base, cavity small; basin deep; flesh tender, juicy, with a pleasant sub-acid flavor. Valuable in Va. and N. C. as a long keeper. Tree productive.

Cannon Pearmain. Rather large, roundish or oblong-conical, red on yellow; cavity small, basin abrupt; flesh yellowish, firm, rich, spicy, mild sub-acid. Keeps till spring. Tree vigorous, spreading, productive. South and South-west.

Carnahan's Favorite. Large, roundish conic, red on yellow; cavity and calyx large, basin furrowed; flesh fine grained, pleasant, sub-acid. Tree vigorous, productive. Keeps till spring. Ohio.

Carolina Queen. (Carolina Winter Queen.) Rather large, roundish, slightly oblate, smooth and regular; greenish yellow shaded and striped with light dull red; stalk three-fourths of an inch long, cavity wide and rather inclining to obtuse, basin ribbed; flesh yellowish white, sprightly, sub-acid, of an excellent flavor. Early winter. Popular in North Carolina.

Carter. (Magnum.) Medium to large, roundish-ovate, red on orange yellow; stalk rather short, cavity deep, calyx large, open, in a wide, deep, somewhat furrowed basin; flesh tender, mild, pleasant. One of the best apples in the Southern States.

Carthouse. (Gilpin, Romanite, Red Romanite, and Small Romanite, of the West.) Medium or rather small, roundish-oblong, nearly regular, apex flattened; striped and shaded deep red on greenish yellow ground; stalk one-half to an inch long, slender; basin slightly furrowed, wide, distinct; flesh tough, crisp, fresh, agreeable, mild sub-acid, nearly sweet, of moderate quality. Keeps fresh till late in spring. Much cultivated as a long keeper at the West.

Chandler. Large, roundish, slightly flattened, somewhat angular, striped and shaded red on greenish yellow; stalk short, cavity large, calyx small, in a wide, plaited basin; flesh greenish white, tender, with a moderately rich, sub-acid flavor. Early winter. Conn.

Cogswell. Rather large, roundish-oblate, regular, striped rich red on yellow; stalk small, cavity large, russeted; calyx short, basin small; flesh yellowish, compact, tender, scarcely sub-acid, with a fine, rich, aromatic flavor. Through winter. An excellent dessert fruit. An abundant bearer every other year. Conn.

Cooper's Red. (Cooper's Market, Cooper's Redling.) Size medium, oblong, conical, shaded and striped with red on yellow; stalk short, cavity deep, narrow; basin small; flesh white, tender, with a brisk, sub-acid flavor. Through winter. Shoots long, slender. Profitable, although not of highest quality. N. J., N.Y., and Mich.

Cullasaga. Rather large, roundish, slightly conical, striped crimson on yellow; stalk short, slender, cavity deep, russeted; calyx open,

basin shallow, furrowed; flesh yellow, tender, very mild, aromatic, rich. A well known, long keeping, valuable Southern fruit.

Detroit. (Red Detroit.) Medium or rather large, roundish or slightly conical; skin thick, smooth, dark purple when mature; cavity deep, basin shallow, plaited; flesh white, often stained with red, crisp, of an agreeable sub-acid flavor.

The *Black Detroit*, or *Grand Sachem*, is a larger apple, more irregular, rather dry fruit of inferior quality.

DOMINIE. (Wells, of Ohio.) Rather large, roundish-oblate; surface with narrow and distinct stripes of light red, on whitish yellow ground; dots or specks large, rough; stalk three-fourths of an inch long, cavity wide, deep, acute; basin deep, obtusely ribbed; flesh white, firm, mild sub-acid, spicy, fine flavored. Shoots very long, vigorous, diverging, leaves drooping, coarsely serrate. Productive. Keeps through winter. Tender at the West.

DUTCH MIGNONNE. Quite large, roundish, regular; rich orange, dotted, mottled, and obscurely striped with bright red, slightly russeted; stalk nearly an inch long, slender; calyx large, open; basin large, round, even; flesh firm, becoming tender, with a high, rich, rather acid flavor. Early winter. Native of Holland. A large, handsome, high flavored, but rather coarse fruit.

Eustis. (Ben.) Rather large, roundish, very slightly ovate; striped and dotted with light rich red on rich yellow; stalk very short; basin narrow, rather deep; flesh yellowish, rich, sub-acid, fine. Origin, Essex co., Mass.

Evening Party. Rather large, oblate, slightly oval, yellow, striped with red; stalk short, inserted in a round, deep cavity, often russeted; calyx closed, basin large; flesh juicy, tender, crisp, with a vinous, aromatic flavor. An excellent dessert fruit. Tree healthy, vigorous, a good bearer. Dec. and Jan. Penn.

Flushing Spitzenburgh. Medium, roundish conical, rich red on yellow, with large whitish or fawn spots; cavity, basin, and calyx small; flesh whitish yellow, crisp, with a very mild sub-acid, moderate flavor. Early winter. Shoots strong, brown, unlike the slender, grey shoots of Esopus Spitzenburgh.

Granite Beauty. Large, roundish-ovate, longest at middle, ribbed, skin yellow striped bright red; stalk short, slender, cavity rather small, ribbed; basin medium, furrowed; flesh juicy, rich sub-acid, quality medium. Early and mid-winter. Growth rather spreading. N. H. (Hov. Mag.)

HALL. Rather small, roundish, slightly oblate, striped red on greenish yellow, with russet dots; stalk slender, curved, cavity round, medium; basin small, plaited; flesh yellowish, fine grained, with a very rich, mild sub-acid, aromatic flavor. Through winter. A widely cultivated and highly esteemed Southern variety. Growth moderate, upright, shoots slender, reddish. Hardy.

HEREFORDSHIRE PEARMAIN. (Royal Pearmain, Winter Pearmain, erroneously.) Medium in size, round-oblong, approaching obtuse-conical; surface mostly covered with indistinct stripes and soft clouds of light red on greenish yellow, which on ripening becomes a pale clear yellow; stalk half an inch long, cavity small; calyx large, open; basin narrow, plaited; flesh yellowish white, fine-grained, with a pleasant, mild sub-acid, aromatic, fine flavor. Early winter. Best on light soils. Distinguished from Winter Pearmain by its stronger shoots, less oblong form, and by the soft shades and clouds of fine red, which cover the surface.

Hess. Medium, roundish or conical, striped with red; stalk short, rather stout, cavity narrow, deep; basin deep, narrow; flesh greenish white, tender, with a very good, aromatic flavor. Through winter. Pa.

Hollow Crown. Size medium, oblong, oval, flattened at crown; skin yellow, striped and splashed with red; stalk short, in a moderate cavity; calyx closed, basin broad; flesh yellowish, with a sprightly excellent flavor. Oct., Jan. (Downing.)

HUBBARDSTON NONSUCH. Large, round-ovate, largest at the middle, nearly regular; color with small broken stripes and numerous

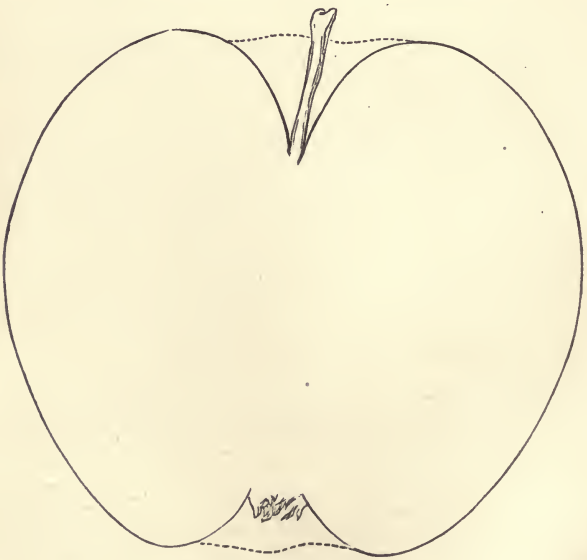

Fig. 255.—*Hubbardston Nonsuch.*

dots of light rich red on a rich yellow ground; stalk three-fourths to one inch long; cavity acute, russeted; calyx open, basin ribbed; flesh yellowish, very rich, slightly sub-acid, with a strong mixture of a rich sweet, flavor excellent. Early winter. A famous New England sort—fine at the North and North-west. Shoots rather slender, grey. A native of Hubbardston, Mass. Loses flavor by keeping.

Indiana Favorite. Medium, oblate, regular, handsome, shaded and striped with red on rich yellow, with large yellow russet specks; stem short, cavity wide, calyx open, in a moderate even basin; flesh yellowish, crisp, a mild sub-acid, agreeable flavor, "very good." Tree spreading, excellent bearer. Keeps remarkably well. It is a seedling of the Vandevere Pippin and resembles it, except in being of a deeper red and much less acid, and superior in flavor.

Jersey Black. Size medium, round, somewhat irregular; striped blackish red on lighter red, with numerous small dots; flesh often stained; stalk variable, cavity deep; basin shallow, plaited; flesh yellow, crisp, juicy, mild sub-acid, agreeable. Early winter. Tree vigorous, but does not grow large; spreading, productive. A valuable market apple at the West.

JONATHAN. Medium in size, round-ovate, or approaching truncate-conical; regular; nearly covered with brilliant stripes of clear red on a pale yellow ground; stalk slender; basin very distinct, rather deep; flesh white, very juicy, spicy, sub-acid, moderately rich. Keeps through winter. Shoots slender, diverging; tree very productive; fruit always handsome and fair. Kingston, N. Y.

The slender growth of the tree is an objection with cultivators. It succeeds well in most localities.

Kaiser. (Red Seek-no-further.) Size medium, roundish-oblate, often slightly oblique, shaded and obscurely striped with red on greenish yellow; stalk short, cavity large; basin shallow, sometimes deep, furrowed; flesh fine grained, mild sub-acid, slightly aromatic, with a very good flavor. Small specimens have a small cavity and are smooth, regular, and are free from ribs. Early winter. South-eastern Ohio. Growth resembles Rambo.

KING. (Tompkins County King.) Large, sometimes quite large, roundish, ribbed; color a deep red, in stripes; flesh tender, juicy, rich, high flavored. Tree a strong grower with few branches. Shoots slightly flexuous; a good but not heavy bearer. Drops its fruit rather early, and should be gathered soon. Early winter, and keeps through winter. Succeeds East and West, at the North, but not so well further South.

Lacker. Rather large, oblate, somewhat irregular; striped light and dark red on greenish yellow, with conspicuous whitish specks; stalk half an inch long; basin furrowed; flesh white, fine grained,

firm, crisp, fresh, mild, agreeable, sub-acid. Keeps through winter. Cultivated in Western New York; originally from Lancaster, Pa.

Limber Twig. (James River.) Large, roundish, slightly conical, striped and splashed with red on yellow; stalk long, slender, calyx rather small; flesh yellowish, very compact, not high flavored, but cultivated in the South and West for its keeping properties. The tree is ill-shapen, with pendent branches, whence its name. Distinct from the Willow Twig.

Long Stem of Pennsylvania. Rather small, roundish-oval; shaded and slightly striped with red or crimson on yellow; stalk long, slender, curved, cavity large; basin somewhat furrowed; flesh tender, crisp, with a rich, aromatic, sub-acid, excellent flavor. Berks co., Pa. A fine dessert fruit.

Marston's Red Winter. Large, roundish-oval, regular, slightly narrowed to each end, smooth; striped with bright red and crimson on yellow ground; stalk half an inch long, slender, cavity russeted; basin abrupt, round, smooth; flesh yellowish, fine grained, tender, juicy, high flavored. Ripens through winter. Origin, New Hampshire.

McLellan. (Martin.) Medium in size or rather large, nearly round, smooth, regular; striped and mottled with lively clear red on yellow ground; stalk three-fourths of an inch long, slender, cavity narrow; basin narrow, waved; seeds small; flesh nearly white, fine grained, very tender, slightly sub-acid, agreeable, but not very rich. Early winter. Very productive. A native of Connecticut.

Milam. Rather small, roundish, greenish, shaded and striped with red; flesh rather firm, with a pleasant, sub-acid, moderate flavor. A good keeper. Although not of high flavor, it is widely cultivated at the West and South-west on account of its hardiness, productiveness, and good keeping qualities. Does not succeed well further north.

Minister. Large, rather irregular, oblong-conical, ribbed, surface more or less wavy, base broad, apex very narrow; very distinctly striped with red on greenish yellow ground; stalk one inch long, slender, cavity usually wide, shallow, and irregular; flesh yellowish, moderately rich, sub-acid, flavor second quality. Productive, fair, and showy. Early winter. Shoots somewhat flexuous.

Mother. Rather large, oblong-ovate, approaching conical; slightly and obtusely ribbed; color a high warm rich red on yellow ground; deep red to the sun—in obscure broken stripes and spots; stalk three-fourths of an inch long, cavity moderate; basin small, plaited; flesh yellow, more so towards the outside, moderately juicy, rich, very spicy, very mild sub-acid, with an admixture of

sweet. Somewhat resembles the Esopus Spitzenburgh in external appearance, and in its rich yellow flesh and spiciness. Growth slow. Late autumn and early winter. Worcester co., Mass.

Monk's Favorite. Large, roundish, slightly oblate, ribbed; mottled and striped red on yellow; stalk short, cavity wide, calyx small in a broad basin; flesh yellowish white, with a very good sub-acid flavor. A long keeper.

Newark King. Size medium, conical; skin smooth, red in streaks on yellow ground; flesh tender, rather rich, pleasant. Early winter. Origin, New Jersey.

New York Vandevere. (Newtown Spitzenburgh, Ox Eye.) Medium in size, round-oblate, regular; color light red in indistinct streaks on yellow ground, often a high red where exposed; dots numerous; stalk uniformly about half an inch long, cavity and basin wide; flesh light yellow, with a rich, mild, sub-acid, excellent flavor. Early winter. Not always fair—succeeds best on light soils. Shoots spotted; leaves doubly serrate-crenate.

Nickajack. (Summerour, Berry, Edwards, Carolina Spice, Red Hazel.) Rather large, smooth, handsome, roundish, slightly oblong; splashed, striped, and mottled with deep red, and with large whitish spots; stalk short, deep set, basin moderate, rim obtuse, calyx open; flesh yellow, rather firm, sub-acid, spicy, very good. Keeps till spring. Growth irregular—a good bearer. A standard Southern variety, and a good market sort in lower Ohio valley.

Northern Spy. Large, roundish-conical, often flattened, slightly ribbed, handsomely striped with red; stalk and calyx deep set; flavor rich, aromatic, mild sub-acid, fine. Keeps through winter and late into spring; preserves its flavor remarkably fresh. Shoots dark, spotted, erect, stout. A tardy bearer. To afford fine fruit, the tree must be kept thrifty by good cultivation. A native of East Bloomfield, N. Y. A fruit of the highest quality, and profitable for market under proper cultivation, and with care in picking, assorting, and packing. Succeeds throughout the North and North-west, but less valuable further south.

Osceola. Size medium, roundish-oblate, angular; skin yellowish, shaded and striped with red, stalk small, cavity large, russeted, basin deep; flesh yellowish, firm, crisp, mild sub-acid, "very good." A good keeper. Indiana. Resembles New York Vandevere.

Pryor's Red. (Pryor's Pearmain.) Medium or rather large, roundish, irregular, varying, apex often broad, sometimes narrow, considerably or slightly ribbed; color dull brick red on greenish yellow in dots, shades, and obscure streaks, slightly russeted; stalk long or short, cavity small; calyx open, basin narrow; flesh very tender, mild, rich, sub-acid, agreeable. Highly esteemed in

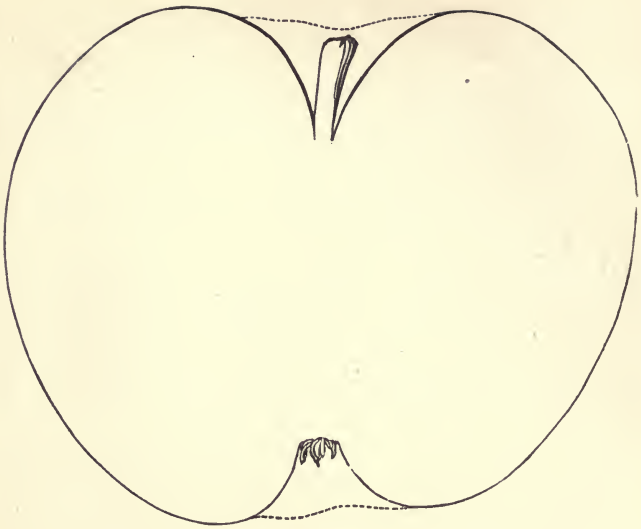

Fig. 256.—*Northern Spy.*

Indiana, Kentucky, and Virginia—where it keeps till spring—and succeeds well further north. Often a poor bearer.

Ragan. Large, roundish-ovate, striped and marbled with red on light greenish yellow ground; stalk medium to long, cavity deep, basin deep; flesh yellowish white, of a rich, spicy, rather acid flavor. Early winter. Putnam co., Ind.

Rawle's Jannet. (Rawle's Jenneting, Neverfail, Rockremain.) Medium in size, roundish, approaching oblong or obtuse-conical, often oblique; color pale red, distinct stripes on light yellow ground; stalk half an inch long; flesh nearly white, fine, mild, sub-acid, fine texture, crisp, juicy. Growth slow; a profuse bearer, with a portion of the crop knotty or under size. Keeps through spring. Highly esteemed in the Ohio valley; does not succeed further north. The blossoms open ten days later than usual, thus sometimes escaping spring frosts; and hence the name Neverfail. Hardy far west.

Red Canada. (Nonsuch, Old Nonsuch of Mass., Richfield Nonsuch of Ohio.) Medium in size, roundish-conical, regular; nearly the whole surface covered with red, and interspersed with large and rather indistinct whitish dots; stalk about an inch long, in a very wide and even cavity; basin nearly even, moderate; flesh

fine grained, compact, with a rich, sub-acid, high and excellent flavor. Keeps through winter. Shoots rather slender, leaves wavy. Productive. Succeeds in New England, New York, and Ohio. This is wholly distinct from the Nonsuch of England, to

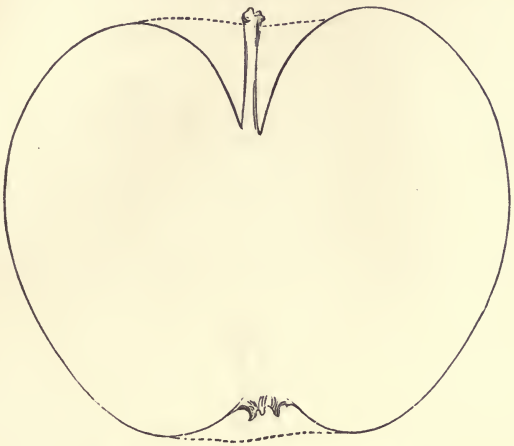

Fig. 257.—*Red Canada, or Old Nonsuch.*

prevent confusion with which, the name Red Canada is preferred. One of the finest table apples, often keeping late in spring. The slender growth of the tree, the frequent scabbiness of the fruit, and its moderate crops in some localities, are the chief drawbacks on its value.

Red Winter Pearmain. (Red Lady Finger, Meigs, Red Fall Pippin, and Red Vandevere of Tennessee.) Size medium, oblong conical, dark purplish red on yellow, with numerous whitish dots; stalk short, cavity narrow; basin small; flesh whitish, very tender and juicy, with a mild, slightly sub-acid, slightly aromatic flavor. Mid-winter. Growth moderate, upright; a regular bearer.

Robey's Seedling. Large, roundish-conic, obscurely striped with lively red; flesh yellowish, juicy, with a rich, high flavor. Early winter. Succeeds in Middle and Western States. Tree vigorous and productive.

Rome Beauty. Large, roundish, very slightly conical; mostly covered with bright red on pale yellow ground; flesh tender, not fine grained, juicy, of good quality. Ripens early in winter. The large size and beautiful appearance of this new Ohio apple render it popular as an orchard variety.

Russet Pearmain. Size medium, roundish-conical; faint red stripes on greenish yellow ground; flesh juicy, tender, rich, fine sub-acid flavor. Through winter.

Shockley. (Waddel's Hall.) Medium, roundish-oblong, narrowing to the eye; yellow striped and clouded with red, with dark greenish russet blotches; stalk long, slender, cavity narrow, deep; flesh firm, of good but not high flavor. Georgia. Ripens from Oct. to March. Wm. N. White.

Smith's Cider. Medium or rather large, roundish-oblong, somewhat flattened at the ends. Shaded and slightly striped with light red on pale greenish yellow, with a few conspicuous whitish yellow dots; stalk slender, cavity rather deep, calyx large, basin shallow, wrinkled; flesh whitish, tender, crisp, with a sub-acid, moderate flavor. Grown in Pennsylvania and the Ohio valley. Valued for its hardiness, productiveness, and handsome fair fruit.

Spitzenburgh, Esopus. Rather large, round-ovate, slightly conical; surface a high rich red, rather obscurely striped; stalk three-

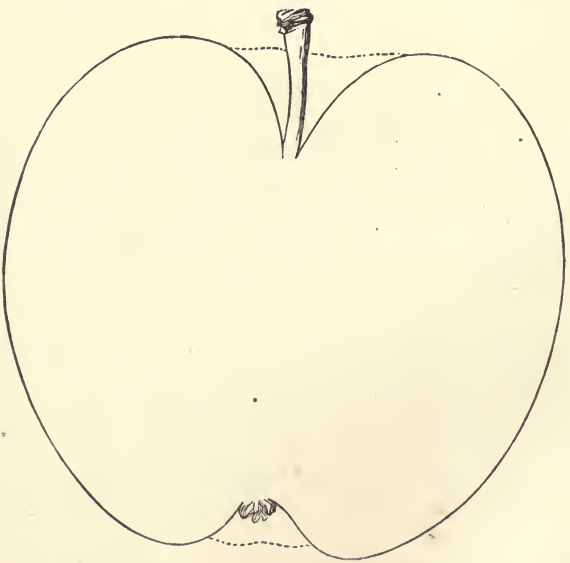

Fig. 258.—*Esopus Spitzenburgh.*

fourths of an inch long, rather slender; basin shallow, slightly furrowed; flesh yellow, firm, crisp, spicy, rather acid, nearly

unequalled in its high rich flavor. Keeps through winter. Shoots ascending and erect, rather slender, leaves crenate. Usually a moderate bearer. Succeeds best in New York, its native State.

WAGENER. Medium, oblate, obscurely ribbed, shaded and indistinctly striped with pale red, and a full, deep red in the sun, on warm yellow ground; often streaked with russet; stalk three-

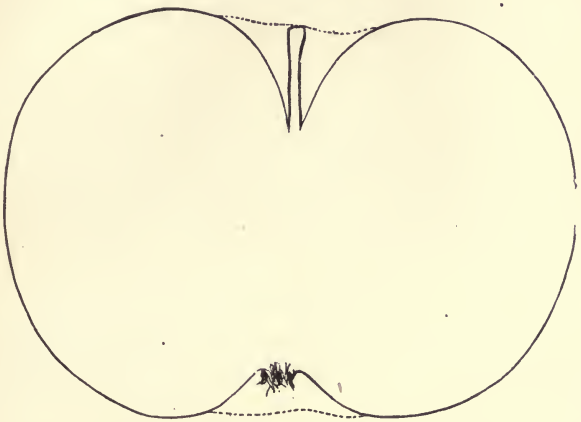

Fig. 259.—*Wagener.*

fourths of an inch long, cavity wide, rather obtuse; basin even, rather large; flesh yellowish, fine grained, tender, compact, mild, sub-acid, aromatic, excellent. Ripens through winter. A native of Penn Yan, N. Y. Succeeds well at the West. An early bearer.

Wellford's Yellow. Rather small, roundish-oblate; faintly streaked with red on pale yellow; flesh yellow, fine grained, juicy, with a rich, aromatic flavor. Rapid grower, great bearer, and long keeper. Cultivated in Maryland and Virginia.

WESTFIELD SEEK-NO-FURTHER. (Connecticut Seek-no-further, New England Seek-no-further.) Medium or large, roundish, often slightly conical, obscurely striped with light dull red, more or less russeted, rarely covered wholly with russet; stalk slender; calyx partly open; flesh tender, rich, spicy, of fine flavor. Early and mid-winter. Tree productive, fruit always fair. Leaves sharply serrate. Succeeds well throughout the Northern States and Ohio.

WILLOW TWIG. Large, roundish, slightly conical, obtuse, very regular; greenish yellow, striped and mottled faintly with dull red; stalk short; basin very wide and deep, rim obtuse; flavor sub-acid, or rather acid, not rich. A long keeper. Shoots slender. Cultivated much as a market apple in Southern Ohio.

Wine. (Hays' Apple, Hays' Winter.) Rather large, often quite large, roundish, slightly flattened; obscurely striped and mottled with red on yellow ground; stalk quite short; cavity deep, acuminate; calyx large, open; basin large; flesh yellowish white, with a rich sub-acid flavor. Early winter. There are several spurious varieties under this name.

WINESAP. Size medium, round-ovate, slightly conical, sometimes obscurely flattened; color a lively deep red; stalk slender, three-fourths of an inch long; cavity acute; calyx small, in a finely plaited basin; flesh yellowish, firm, crisp, with a rich sub-acid or rather acid flavor. Keeps through winter. One of the best apples for baking. Growth rather irregular, fruit formerly always fair, of late years more imperfect. Widely cultivated at the West and South-west.

Section II.—Not striped.

Aunt Hannah. Size medium, roundish, approaching ovate; straw color, with a very pleasant mild sub-acid, fine flavor, resembling in character the Newtown Pippin. Origin, Essex county, Massachusetts.

Belle et Bonne. Large, roundish, flattened at ends, obtuse; greenish yellow; stem short; calyx in a wide, deep basin; flesh yellow, tender, large grained, sub-acid, agreeable, and very good. Early winter. A Connecticut apple; a strong growing and productive variety, much esteemed in the neighborhood of Hartford.

BELMONT. Rather large, roundish-conical or ovate-conical, apex usually narrow, but sometimes quite obtuse; faintly ribbed, smooth; color clear pale yellow, with sometimes a light vermilion blush, and rarely with large thinly scattered carmine dots; stalk varying from half an inch long and stout, to an inch or more long and slender; basin in conical specimens, narrow and shallow; in obtuse specimens, narrow and deep, with an obtusely ribbed rim; flesh yellowish white, compact, crisp, becoming quite tender, with a mild, rich, sub-acid, fine flavor. Leaves crenate. Early winter. A profuse bearer. Excellent in New York, Michigan, and Northern and Central Ohio—worthless at Cincinnati. Tender at the West.

Brookes' Pippin. Large, roundish, slightly conical; greenish yellow, with a faint blush; stalk short and stout, cavity deep, russeted; basin small, shallow, furrowed; flesh crisp, aromatic. Nov to Mar. Productive. Maryland and Virginia.

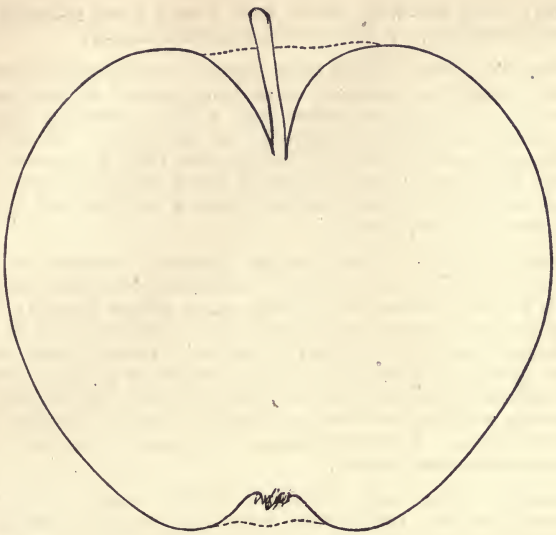

Fig. 260.—*Belmont.*

BULLOCK'S PIPPIN, or AMERICAN GOLDEN RUSSET. (Golden Russet, Sheepnose.) Rather small, conical; light yellow, sprinkled and sometimes overspread with thin russet; stalk long, slender; basin very small and narrow, ribbed; flesh yellowish white, very fine grained, becoming very tender, with a mild, rich, slightly sub-acid flavor. Growth erect, shoots rather slender; leaves sharply serrate; tree overbears. Early winter. When well ripened, this apple is exceedingly delicate and tender; sometimes it does not become soft in ripening, when the quality is poor, and often worthless. It is too small to become very popular. Generally rendered worthless at the East by black mildew, and becoming more affected with it at the West.

Canada Reinette. (Reinette du Canada, Canadian Reinette.) Quite large, somewhat conical and flattened; rather irregular, ribbed, apex obtuse; greenish yellow, sometimes a brown cheek; stalk short, cavity wide; calyx large, basin rather deep, irregular; flesh nearly white, rather firm, becoming quite tender, juicy, with a good, lively sub-acid flavor. Early and mid-winter.

Clarke's Pearmain. Size medium, roundish, slightly conical; skin inclining to rough yellow and russety in shade, light rich red in the sun, thickly dotted with whitish russet; cavity and basin me

dium; flesh yellowish white, with a very good sub-acid flavor. Tree productive. A well known Southern variety.

Cumberland Spice. Rather large, varying from roundish conical to long conical, the tapering sides being nearly straight and not rounded; color waxen yellow, with a slight vermilion tinge near the base, and with black specks on the surface; stalk half to three-fourths of an inch long, cavity wide, slightly russeted; calyx open, basin even; flesh yellowish white, breaking, rather light; core hollow; flavor mild sub-acid, with a peculiar and agreeable spiciness, of good quality.

ENGLISH RUSSET. (Poughkeepsie Russet.) Medium or rather small, roundish-conical, regular; surface more or less overspread with brownish russet on light greenish yellow ground; in large exposed specimens, wholly russeted; stalk one-half to three-fourths of an inch long, cavity moderate, round; basin smooth; flesh greenish or yellowish white, texture fine, rather firm, with an aromatic, sub-acid flavor. Keeps through spring, and often through summer for twelve months. Growth upright, shoots lively brown. A profuse bearer. A profitable market variety, but of rather poor quality.

Equinetely. Fruit large, roundish, slightly oblate; dark red on whitish yellow; stalk short, fleshy, cavity large; basin deep, irregular; flesh yellowish, a little coarse, tender, mild sub-acid, of medium quality. A valued Southern variety.

FALLAWATER. (Tulpahocken, Fornwalder.) Rather large, roundish, and slightly ovate-conical, very regular, smooth; color a smooth shade of dull red on light greenish yellow, with a few large whitish dots; stalk slender, cavity narrow, acuminate; basin small; flesh greenish white, fine grained, with a mild, slightly sub-acid, moderate flavor. Early winter. A native of Pennsylvania. Although this fruit is of quite moderate quality, its large size and fair appearance render it very popular in Penn., Ohio, and portions of the West.

Fulton. Rather large, roundish, flattened at ends, slightly oblique; skin smooth, yellow, often with a handsome blush; stalk rather short, cavity deep; basin large, slightly wrinkled; flesh yellowish, white, fine grained, with a mild sub-acid flavor. Illinois—valued at the West.

Golden Ball. Large, often quite large, roundish, remotely conical, ribbed; fine yellow; stalk short, slender, with fine green rays or furrows radiating from the centre of the cavity; basin very shallow; flesh tender, rich, aromatic. Ripens late in autumn, and keeps through winter. Liable to vary in size and fairness. Excellent for cooking. Tree very hardy; a poor bearer. Cultivated chiefly in Maine.

Golden Pippin, of Westchester County. (American Golden Pippin,

New York Greening.) Form variable, oblate, globular or conic, ribbed; skin golden yellow; stalk short, deeply set; basin irregular; flesh yellow, tender, juicy, with a rich, refreshing, aromatic flavor. Early winter. Tree spreading—very productive.

GOLDEN RUSSET. (Golden Russet of Western New York.) Size medium, roundish, usually a little oblong, sometimes slightly flattened, nearly regular; surface sometimes wholly a thick russet, and at others a thin broken russet on a greenish yellow skin; stem slender, from half an inch to an inch long, being longest on oblate specimens; flesh fine grained, firm, crisp, with a rich, aromatic flavor. Shoots speckled; tree rather irregular. Keeps through winter. This is distinct from the English Russet, of straight upright growth, and a very long keeper, and from the American Golden Russet or Bullock's Pippin.

Green Seek-no-further. Large, often quite large, roundish, slightly approaching oblong obtuse conical; greenish yellow becoming yellow, specks large and conspicuous; stalk very short; calyx large, basin slightly ribbed, deep; flesh rather coarse, sub-acid, of good flavor.

Grimes' Golden Pippin. Above medium, roundish, slightly oblong, regular; skin yellow, with large russet dots; stalk slender, in a deep cavity; basin deep, slightly wrinkled; flesh of yellowish-white, with a mild, sub-acid, agreeable, very good flavor. Nov. Virginia and Ohio Valley.

Hughes. Large, roundish; skin greenish yellow, with a blush; stalk slender; calyx large, open; basin wide, deep; flesh fine grained, tender, with an excellent, agreeable, aromatic flavor. Berks co., Pa.

LADY APPLE. (Pomme d'Api.) Quite small, regular, flat; a brilliant deep red cheek on light clear yellow, stalk and calyx deep set; flesh tender, delicate, sub-acid, flavor good. A fancy apple. Winter and spring. Shoots small, dark, erect. Productive. Tree rather tender.

Loudon Pippin. Large or very large, roundish, slightly flattened, obtuse-conical; greenish yellow; stalk very short; calyx large, in a smooth even basin; flesh sub-acid, of a good second-rate flavor. Early winter. Much cultivated in Northern Virginia; and from its large size and handsome appearance sells well in the Washington market. Productive.

MICHAEL HENRY PIPPIN. Size medium, roundish-ovate, apex narrow; yellowish green; stalk short, rather thick; basin narrow; flesh yellow, tender, juicy. Growth upright. Through winter. Origin, Monmouth co., N. J.

MONMOUTH PIPPIN. (Red-cheeked Pippin.) Rather large, roundish-oblate, light greenish yellow, with a fine red cheek; flesh crisp, juicy, mild sub-acid, with a good rich flavor. Keeps through winter.

Monstrous Pippin. (Gloria Mundi, Ox Apple, Baltimore.) Very large, roundish, somewhat flattened at the ends, slightly angular or ribbed; skin smooth whitish green, becoming whitish yellow; stalk stout, short; calyx large, basin wide, deep, somewhat ribbed, with an obtuse rim; flesh white, tender, rather coarse, sub-acid, not rich. Late autumn and early winter. A good cooking apple.

Newtown Pippin. (Pippin, Green Newtown Pippin.) Medium or rather large, roundish, oblique, slightly irregular, remotely conical or else a little flattened; dull green becoming yellowish green, often with a dull brownish blush; stalk short, deep set, and surrounded by thin, dull, whitish russet rays; basin narrow, shallow; flesh greenish white, juicy, crisp, fine-grained, with a high, fine flavor. Keeps through spring, and retains remarkably its freshness. Tree of rather slow growth, with a rough bark. The fruit is very liable to black spots or scabs, unless under high, rich, and constant cultivation. One of the best fruits for foreign markets. A native of Newtown, Long Island, and has rarely succeeded well in New England. Tender far west.

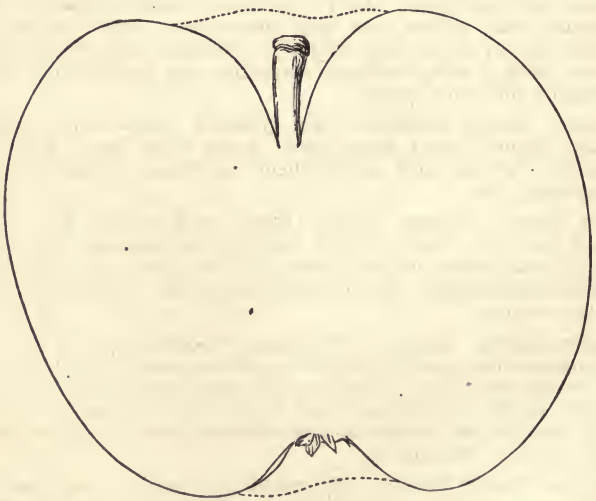

Fig. 261.—*Green Newtown Pippin.*

Newark Pippin. (French Pippin, of some.) Rather large, round-oblong, regular; greenish yellow, becoming yellow; stalk and calyx deep set; flesh tender, rich, and high flavored. Growth crooked, irregular. Early winter.

ORTLEY. (White Detroit, Ortley Pippin, Warren Pippin, White Bellflower, Woolman's Long, Detroit, Jersey Greening, Detroit of the West.) Large, roundish, somewhat oblong-ovate, pale yellow, slightly tinged with pink in the sun; stalk about an inch long; sometimes short, but always slender; cavity deep and narrow; basin rather deep, nearly even or slightly plaited; flesh sub-acid, crisp, sprightly, rich, fine. Shoots slender. This fine fruit has had a high reputation in the Ohio Valley, but it is becoming much affected with the black mildew or scab.

PECK'S PLEASANT. Large, often quite large, roundish, sometimes remotely oblong, often a little oblique, usually slightly flattened; smooth and regular; color light green, becoming yellow, with a brown blush; stalk very short, one-fourth to one-half an inch long, thick, rarely longer and somewhat slender; calyx open, basin abrupt, rather deep; flesh compact, very tender, with a mild, rich, fine, clear sub-acid, Newtown Pippin flavor. Early winter; poor, if too ripe. Growth rather erect. Shoots somewhat diverging. A good bearer; fruit always fair. Tender far west.

Pittsburgh Pippin. (Father Apple, Switzer Apple, William Tell.) Large, roundish-oblate; pale yellow; stalk small, cavity large; basin broad-furrowed; flesh tender, with a mild sub-acid flavor. Early winter. Valued in Pennsylvania. An irregular, spreading grower.

POMME GRISE. (Grey Apple.) Rather small, roundish-oblate, a grey russet; stalk slender, cavity wide, rather obtuse; calyx small, basin round; flesh very tender for a russet, and fine grained, rich, and high flavored. Canada. One of the best dessert apples for the extreme north.

Pound Royal. (Pomme Royale, *erroneously*.) Large, sometimes furrowed, roundish, slightly oblong, a little uneven; surface whitish yellow; stalk slender, an inch and a quarter long, cavity large; basin furrowed, irregular; flesh tender, breaking, fine grained, mild, agreeable, sprightly. Ripens through winter. Tree vigorous, productive. Origin, Pomfret, Conn.

Progress. Rather large, roundish-conical, often slightly oblate; smooth, yellow, often with a brownish cheek; stalk short, cavity russeted; calyx large, basin shallow; flesh crisp, with a pleasant sub-acid flavor. Conn.

Red Russet. Large, roundish-conical; yellow, shaded with dull red and deep carmine in the sun; thickly dotted with some rough russet; stalk short and thick; calyx with long segments, basin narrow, uneven; flesh yellow, solid, crisp, tender, with an excellent, rich, sub-acid flavor, somewhat resembling Baldwin. (C. Downing.)

RHODE ISLAND GREENING. (Greening.) Large, roundish-oblate;

green, becoming greenish yellow, always fair, a dull brown blush to the sun; stalk three-fourths of an inch long; basin rather small, often slightly russeted; flesh yellow—a rich yellow if much exposed to the sun, and whitish yellow or greenish white if much shaded—tender, juicy, with a rich rather acid flavor. Growth strong, young trees crooked or oblique, shoots rather spreading, leaves sharp serrate; very productive, single trees sometimes yielding forty bushels of fair fruit in favorable years, and orchards, 500 bushels per acre. Fine in New England and New York. Tender far west.

Roman Stem. Medium in size, round ovate; whitish yellow, with a faint brownish blush; stalk one-half to three-fourths of an inch long, with a fleshy protuberance at insertion; cavity shallow; basin narrow, slightly plaited; flesh tender, juicy, mild sub-acid, good second-rate flavor. Keeps through winter. A New Jersey fruit which succeeds well throughout the Ohio Valley and Middle States. Hardy far west.

ROXBURY RUSSET. (Boston Russet, Putnam Russet of Ohio) Medium or large, roundish-oblate, remotely conical; partly or wholly covered with rather rough russet on greenish yellow ground, sometimes a dull brown cheek; stalk one-half to an inch long, cavity acute; basin round, moderate; flesh greenish white, rather granular, slightly crisp, with a good sub-acid flavor. Keeps late in spring. Large specimens become conical, with short thick stalks; small specimens are more flat, and with longer and more slender stalks. Growth spreading, shoots downy. Although not of the highest flavor, its productiveness, uniformly fair fruit, and long keeping, render this variety one of the most profitable for orchard culture. It succeeds well throughout the Northern States, but partially fails in a few localities at the West.

SWAAR. Rather large, roundish, slightly flattened at the ends, often considerably oblate, sides regularly rounded, crown as wide as base; color greenish yellow becoming a rich yellow, sometimes faintly russeted, and a small blush near the base, when much exposed to the sun; stalk rather slender, three-fourths of an inch long, cavity round, moderate, or often small; basin small, even; flesh yellowish, fine grained, compact, tender, with a very rich, mild, aromatic, agreeable, slightly sub-acid flavor. Esteemed by some as the finest winter table apple. Ripens through winter and keeps into spring. Shoots ascending, buds large, leaves coarsely rounded serrate. Fruit apt to be scabby on old overloaded trees. Not successful in all localities.

Tewksbury Blush. (Tewksbury Winter Blush.) Small, round-oblate; yellow with a red cheek; flesh yellow, juicy, with a good flavor. Keeps till midsummer. Very productive. New Jersey.

Virginia Greening. Large, oblate; skin yellowish, with large brown

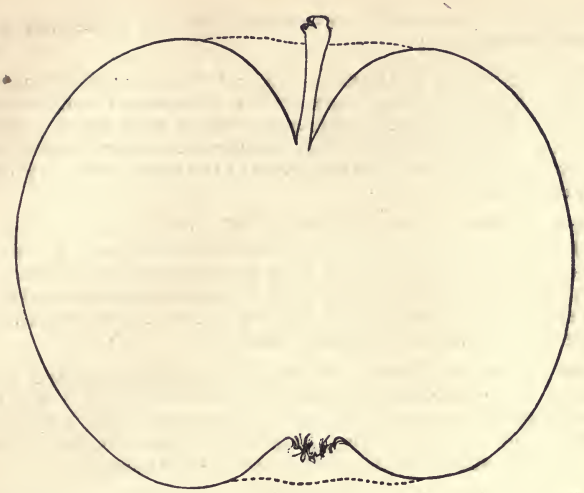

Fig. 262.—*Swaar.*

dots; stalk and cavity large; calyx open, basin large, abrupt; flesh yellow, coarse, with a rather pleasant sub-acid flavor. A good keeper. Southern.

Western Spy. Large, round-ovate, very regular and even, with a beautiful red cheek on a lemon yellow skin; stem short, in a small cavity; flesh yellowish white, sub-acid, of a fine flavor—hardly first-rate. Proved as yet only at the West.

White Pippin. (Canada Pippin.) Large, roundish, oblong, flattened at ends; light greenish yellow; cavity large; basin abrupt, furrowed; flesh yellowish white, sub-acid. Good, but not very rich. Winter. Fair and productive, valued at the West and South-west.

White Rambo. Rather large or medium, roundish-oblate, remotely conical; skin greenish yellow, becoming yellow; cavity large; basin wide; flesh yellowish, with a mild sub-acid, "very good" flavor. Early winter. Ohio.

White Spanish Reinette. (Reinette Blanche d'Espagne.) Very large, roundish, oblong, slightly conical, somewhat angular, ribbed; yellowish green in the shade, rich brownish red next the sun; stalk short, cavity small and even; calyx large, open; basin deep, angular; flesh yellowish white, crisp, flavor rich sub-acid

Growth of tree and fruit resemble that of Fall Pippin, but it keeps longer.

WHITE WINTER PEARMAIN. Rather large, conical, angular or ribbed; light yellowish green, with a brownish red cheek; stem short; flesh whitish, fine grained, with a mild sub-acid, rich, fine flavor. This is distinct from the Michael Henry Pippin, which it resembles, and at the West is one of the best and most productive winter apples.

Winter Cheese. (Green Cheese.) Medium in size, oblate; green in the shade, red in the sun; flesh very crisp, very tender and delicate, sprightly, and of a fine, pleasant flavor. One of the most highly esteemed early winter apples of Southern Virginia, closely resembling the Fall Cheese, but a longer keeper. Becomes mealy and insipid after maturity.

Winter Pippin of Geneva. Large, oblate, slightly angular; yellow, with a crimson cheek sparsely covered with grey dots; stalk small, cavity narrow; calyx open, segments long; basin open; flesh yellow, tender, vinous, excellent. Ripens through winter. Tree and fruit resemble Fall Pippin. (C. Downing.)

Wood's Greening. Large, roundish, a little oblique, slightly flattened, obscurely conical; pale green, smooth; stalk very short, cavity acuminate; calyx rather large, basin distinct, slightly plaited; flesh greenish white or nearly white, fine grained, slightly crisp, tender; flavor very agreeable, mild sub-acid, first-rate, but not very rich.

YELLOW BELLFLOWER. (Bellflower, Yellow Belle Fleur.) Large, often quite large, oblong-ovate, apex quite narrow and conical, more or less irregular; surface pale yellow, often with a blush; stalk slender; basin ribbed; seeds long; flesh very tender when ripe, fine grained, crisp, juicy, acid, becoming sub-acid, excellent. Keeps through winter. Shoots yellowish, rather slender; growth of the tree rather upright; succeeds best on rather light soils. Adapted to the climate of the Northern and Middle States, as far south as Kentucky, but fails by premature dropping in many localities. More tart and less rich in cold summers, and far North. Hardy at the West.

YELLOW NEWTOWN PIPPIN. Medium, or rather large, roundish, oblate and oblique, more or less flattened; yellow, with a brownish red cheek, purplish before ripe; stalk very short; flesh firm, crisp, with a rich, mild flavor. Closely resembles the Green Newtown Pippin, and believed by many to be identical, differing only by a warmer exposure. It is fairer in some localities than the Green, but is usually inferior to it in flavor.

C. Downing gives the following distinguishing points between these two sub-varieties: "The Yellow is handsomer, and has a higher perfume than the Green, and its flesh is rather firmer and equally

high flavored; while the Green is more juicy, crisp, and tender. The Yellow is rather flatter, measuring only about two inches deep, and it is always quite oblique—projecting more on one side of the stalk than the other. When fully ripe, it is yellow, with a rather lively red cheek and a smooth skin, few or none of the spots on the Green variety, but the same russet marks at the stalk. It is also more highly fragrant before and after it is cut than the Green. The flesh is firm, crisp, juicy, and with a rich and high flavor."

CHAPTER II.

THE PEAR.

THE PEAR, when grown to full perfection, is distinguished for its great delicacy, its melting and juicy texture, and its mild, rich, and delicious flavor. Excelling the apple in these particulars, it falls below it in importance in consequence of the less uniformly healthy habit of the tree.

PROPAGATION.

The best trees are raised from seedling stocks; suckers, unless unusually furnished with fibrous roots, are of crooked, one-sided, and stunted growth.

Raising the Seedlings. The seeds, after separation from the fruit, should be kept as already described for apple-seeds, by mixing with sand or leaf mould. The soil for the seed-bed should be unusually deep and fertile, rather damp than otherwise, and should have a good manuring with lime and ashes, and an abundant supply of peat or muck, if the soil is not already largely furnished by nature with this ingredient.

The mode of sowing the seeds may be the same as that described for the apple, in drills from one to two feet apart. The more thinly they are sown, the less will be the danger of disaster from the leaf-blight; and for this reason, drills near together, with the seeds somewhat sparingly scattered in them, will be found best.

The leaf-blight is the most serious evil met with in the culture of pear-seedlings. It is more formidable in some seasons than in others. Commencing about midsummer, sometimes earlier, but more frequently later, it is first indicated by the leaves in certain parts of the seed-beds turning brown; in a few days they fall off; other portions of the beds are successively attacked, till all the seedlings become more or less denuded, those last affected occupying

the most favorable portions of the soil. As a necessary consequence, growth immediately ceases; and if they are attacked early, and have made but little previous growth, they are nearly ruined, and few will survive the succeeding winter, for they never make a second growth the same year of any value. But if their previous growth has been vigorous, and the blight appears late in summer, much less injury is sustained. The best remedy is high cultivation, on good new soil, and taking out daily every diseased tree.

Wintering the Young Seedlings. The frequent destruction of the trees the first winter is another serious evil. The danger is least with those that have made the best well-ripened growth; hence it becomes very important to secure healthful vigor by the adoption of the cultivation previously mentioned. But in many localities, pear seedlings, which are always remarkably free from fibrous or lateral roots the first year, are drawn out by the freezing of the soil, and either destroyed or greatly injured. Several modes have been proposed to prevent this result, and have been tried to a greater or less extent. One is to induce the emission of lateral roots, by taking up the young seedlings from the thickly sown beds early in the season, and, as soon as four leaves have appeared, cut off their tap roots and reset them in the nursery-rows. Robert Nelson, of Newburyport, Mass., pursued this course with great success; but its general utility may be questioned, except during a rainy period or on favorable soils, unless abundant watering is given. A more easy as well as safe mode would perhaps be to cut off the tap roots, at the same age, by means of a sharp spade thrust beneath the soil, and without transplanting. Neither of these modes could be successfully applied except to large, vigorous seedlings, growing in a deep, rich soil.

But where the growth of lateral roots has not been effected, and the consequent danger is greater of their being drawn upwards by frost, much protection may be given them by covering the whole ground with forest leaves to a depth of several inches; and if the rows are near each other, and the trees several inches or a foot high, they will prevent the leaves from being swept off by the winds. The incursion of mice may be avoided by placing the seed-beds as near as practicable to the middle of a clean ploughed field, and by encircling the ground with a bank or ridge of fresh earth thrown up for this purpose, about a foot high. Mice will not pass such a boundary under the snow.

Taking up the seedlings late in autumn, and burying them in a cellar, or laying them in by the roots and nearly covering the whole stems, will preserve them safely.

Budding may be performed the first summer after transplanting if the stocks have made a good growth. The management of the young trees is the same as for apples, by grafting or budding near the surface of the ground, and heading down, trimming, and cultivation. But as pear-stocks are valuable, budding is to be preferred to grafting, because it may be repeated in case of failure. Root-grafting, in the mode adopted for the apple, nearly always fails. It is successful when large, entire, and branching roots are taken, and the grafts inserted above the crown.

DWARF PEARS.

For orchard culture, and in most parts of the country where the pear flourishes with great vigor and proves highly productive, pear-stocks will doubtless always be found preferable to all others. The advantages of a dwarf growth on dissimilar stocks have been already pointed out under the head of *stocks*. Such trees are not so long-lived as on pear-roots, and they require more thorough and fertile culture, and care in pruning. But they have some important advantages, such as coming soon into bearing, occupying a fifth part of the ground, thriving in many soils where pear-stocks will not, and in a few instances improving the quality of the fruit.

The only reliable stock is the French quince. . Nearly all the experiments with the mountain ash have sooner or later proved failures. Budded or grafted upon apple seedlings, pears sometimes make a feeble growth for a few years ; but unless the grafts themselves throw out roots, by planting beneath the surface, they sooner or later perish. It sometimes happens that grafts of a few varieties inserted at standard height, grow and bear for a few years. The thorn has been used in England, and to some extent in this country, with partial success. But all other kinds of dissimilar stocks have given way to the *quince*, which is much superior for general use to any other.

The varieties of the pear do not grow with equal facility upon the quince. A few, as the Duchesse d'Angoulême, Louise Bonne of Jersey, and Beurré Diel, are so much improved in quality that their cultivation on pear stocks is discontinued by most fruit-growers. A large number flourish well, but are little changed in quality, as White Doyenné and Dearborn's Seedling. A few, on the other hand, succeed badly or wholly refuse to grow upon quince stocks, without *double working*, which consists in first budding some freely growing pear upon the quince bottom, and then budding or grafting the "refractory" sort into the pear shoot.

As a general rule, double-worked trees do not flourish for a great length of time. Single-worked have done well for thirty or forty years under favorable influences.

The following list, made out chiefly from the combined experience of European and American cultivators, may prove valuable to those commencing with dwarf pears:

I. *Pears succeeding better on quince than on pear stocks, and which should be mostly worked as dwarfs.*

Louise Bonne of Jersey,
Duchesse d'Angoulême,
Easter Beurré,
Beurré Diel,
Long Green of Autumn,
Beurré d'Amalis,
Glout Morceau,
Vicar of Winkfield.

II. *Pears usually succeeding well both on pear and quince.*

Beurré Sterkmans,
Buffum,
White Doyenné,
Stevens' Genesee,
Chaumontelle,
Early Rousselet,
Van Mons' Leon Le Clerc,
Jaminette,
Dearborn's Seedling,
Doyenné d'Alençon,
Osband's Summer,
Bloodgood,
Jersey Gratioli,
Passe Colmar,
Pound, or Uvedale's St. Germain,
Beurré d'Anjou,
Catillac,
Soldat Laboureur,
Triomphe de Jodoigne,
Urbaniste,
Rostiezer,
Kingsessing,
Epine Dumas,
Oswego Beurré,
Napoleon,
Capiaumont,
Jargonelle,
St. Germain,
Summer Franc Real,
Tyson,
Madeleine,
Compte de Lamy,
Duchesse d'Orleans,
Forelle,
Delices d'Hardenpont,
Figue,
Beurré Langelier,
Doyenné Boussock,
Nouveau Poiteau,
St. Michael Archange,
Josephine de Malines,
Bergamotte Cadette,
Figue d'Alençon,
Beurré Superfin.

III. *Pears growing on quince, but better on pear stocks.*

Beurré d'Aremberg,
Onondaga,
Seckel,
Gray Doyenné,
Bartlett,
Doyenné d'Eté,
Belle Lucrative.

IV. *Pears usually failing on quince, unless double-worked.*

Beurré Bosc,
Marie Louise,
Gansel's Bergamot,
Dix,
Winter Nelis,
Washington,
Paradise d'Automne,
Sheldon,
Dunmore.

The result is not always the same in different soils and in different seasons. The Seckel, for instance, has wholly failed in one year, and in another, on the same spot of ground, has grown well. The White Doyenné grew finely one summer, and almost totally failed the next. Some sorts which in nearly all cases do well, occasionally prove unsuccessful. A few, uniformly, in all seasons and in all soils, make a rapid and vigorous growth, of which the Louise Bonne of Jersey is perhaps the most striking example; some others, again, invariably fail (unless double-worked), the most prominent among which stands the Beurré Bosc. Indeed, so averse is this variety to a union with the quince, that it is by no means certain that it may not soon fail if worked in whatever manner. In some places, however, double-working has given it smooth and fair fruit where it has been cracked and blighted on the pear. Both this and the Flemish Beauty, as well as the Marie Louise, and some others, succeed well when grafted on the hawthorn.

The changes wrought by the quince stock are often important and interesting. T. Rivers states that the Beurré d'Aremberg ripens several weeks earlier in winter; that the Easter Beurré is rendered more productive and matures its fruit, while on the pear it is a bad bearer, and does not ripen; that the Fortunée is a "perfect crab" upon the pear, but on the quince is melting and juicy; that the Glout Morceau is imperfect and ripens badly on the pear, but is always fair and attains a high and mature flavor on the quince. As a general effect, the size of the fruit is increased, but in a few cases it is rendered more gritty in texture.

Pruning Dwarf Pears. Dwarf pear trees are usually pruned into the *pyramidal* and *conical* form, the latter differing only in its broader shape. The principle to be adopted in pruning has been already explained on a former page; the extent to which it must be carried, should be such as to keep the trees within ten or twelve feet in height, and six or seven feet in diameter at the base. A greater height increases the difficulty of pruning. The same reason forbids the adoption of a head with a clean stem below, as in common standards.

The pyramidal mode of pruning may be applied to pear trees upon pear stocks. Dwarf trees may be planted from ten to twelve feet apart. They will always need careful attention to pruning, and to thorough and enriched cultivation of the ground.

In planting out the dwarf pear, the quince stock should be planted a little below the surface to elude the borer, which often attacks the quince, but rarely the pear. It is sometimes planted deeper for the

purpose of causing the pear to throw out roots of itself, thus chang ing the dwarf to a standard. This practice is objectionable, as such roots are apt to be few or one-sided, inclining or prostrating the tree. It is also desirable to retain the bearing character of the dwarf.

When dwarfs become old, or begin to decline, pear roots may be given to them, and renewed vigor imparted by planting a small pear tree closely on each side, and when these become established, by inarching them into the tree, as shown in the annexed cuts. It is performed as follows:

Make a slit in the bark of the dwarf pear tree, a few inches above

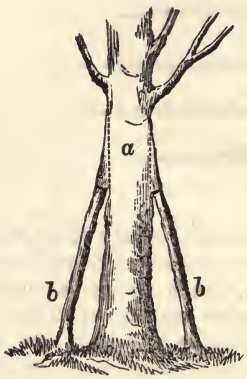

Fig. 263.

Fig. 264.

a, Trunk of Dwarf Pear Tree. b, b, Pear Stocks inserted into it, for new bottom. c, Cut for receiving the Pear Stock. d, Pear Stock, cut sloping before insertion.

ground, and across the lower end of the slit make a cross-cut, so as to form an inverted ⊥. If the tree is large, make a notch instead of the cut, sloping downwards, the better to admit the stock. Then bend the stock against this notch or cross-cut, and mark it at that point. Then with a knife set with the edge upwards at this mark, cut the stock off with a slope two or three inches long. It is then easily bent and inserted into the slit. It may be covered with grafting wax, but grafting clay is much better. This is made of clay or clay-loam one part, and horse manure two parts, well mixed together —the addition of a little hair is an improvement. Cow manure is entirely unfit, being too compact with the clay, and not possessing the fibrous character of the other.

Horizontal Training, for walls or espaliers, is very rarely prac-

tised or needed in this country. It is occasionally employed in limited gardens, to form boundaries of walks, without occupying much lateral space, and where it is desired to grow large and fine specimens of fruit by strong exposure to the sun. The mode may be briefly understood by the accompanying figure representing a partly grown tree (Fig. 265). As the tree advances, shoots will be

Fig. 265.

produced from the sides of the horizontal arms; these must be stopped or pinched off early in summer, to prevent their drawing too hard on the rest of the tree, and a similar course pursued with them to that already described in a former chapter. The fruit-buds, and all the shoots or spurs supporting fruit-buds, are to be cut closely off wherever too thick for an even crop. Early in autumn the shortened shoots are to be cut down, leaving the fruit-buds, only, to bear the next season. By this regularity of pruning, the tree will preserve a neat appearance, and bear regular crops.

The horizontal branches may be about one foot apart for large pears, and eight inches for small; and the trees, if on quince roots, may be about ten feet apart.

SYNOPSIS OF ARRANGEMENT.

DIVISION I. SUMMER PEARS.
- CLASS I. *Distinct pyriform.*
- CLASS II. *Obscure pyriform, obovate, or turbinate.*
- CLASS III. *Roundish or oblate.*

DIVISION II. AUTUMN PEARS.
- CLASS I. *Distinct pyriform.*
- CLASS II. *Obscure pyriform, obovate, or turbinate.*
- CLASS III. *Roundish or oblate.*

DIVISION III. WINTER PEARS.
- CLASS I. *Distinct pyriform.*
- CLASS II. *Obscure pyriform, obovate, or turbinate.*
- CLASS III. *Roundish or oblate.*

FURTHER CLASSIFICATION OF FORMS.

In addition to the several general forms mentioned in the preceding synopsis, the shape is more particularly designated by comparison with well known sorts. No fruit has so many forms as the pear in its different varieties; and to assist the fruit-grower in preserving a recollection of the distinctive characters of each, these forms are classified in the following pages. The distinction between pyriform, obovate, and oblate, which constitute the three principal divisions, has been already pointed out in the chapter on describing fruits; but there are many subdivisions, or less distinct modifications, which, if accurately observed, would additionally distinguish the different varieties. For example, PYRIFORM pears may be divided into *Bartlett-shaped*, where the general form is oblong, but both body and neck rounded and obtuse; *Winkfield-form*, longer and less obtuse; *Bosc-shaped*, when the body is broad and the neck long and narrow; *Tyson-form*, similar to Bosc, but with a shorter and acute neck; *Urbaniste-form*, shorter and less distinctly pyriform; *Diel-shaped*, where the body is large and rounded, and the neck short and obtuse; *Madeleine-shaped*, similar to the last, but of smaller body and lighter form.

Obovate pears may be either *Doyenné-form*, when they slightly approach pyriform; *Buffum-shaped*, or distinct obovate, when gradually rounded towards the stem with no approach to a neck; or *Bloodgood-shaped*, similar to the last, but often shorter and tapering, or rounded into the stalk.

These forms are, of course, more or less variable in the same varieties, but those more generally prevailing are adopted.

PYRIFORM.—*Bartlett-shaped.*

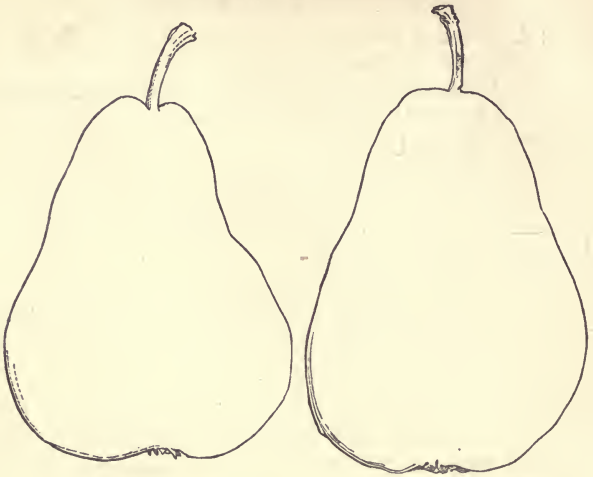

Fig. 266.—*Bartlett.* Fig. 267.—*Beurré Duval.*

Winkfield-shaped.

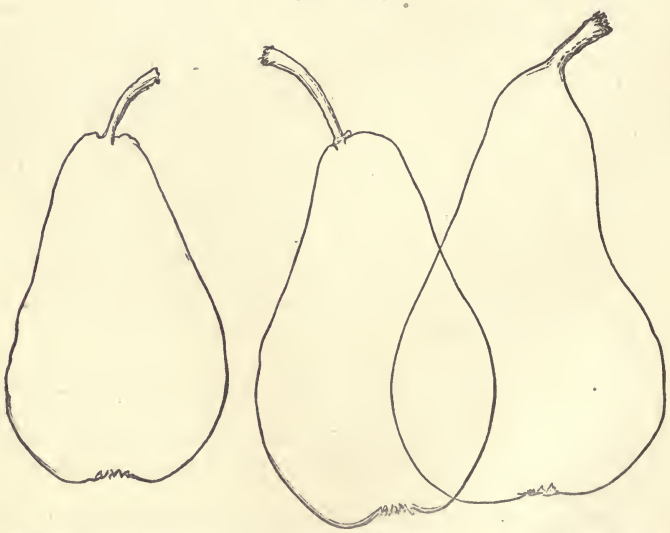

Fig. 268.—*Emile d'Heyst.* Fig. 269.—*Winkfield.* Fig. 270.—*Verte Longue*

PYRIFORM.—*Bosc-form.*

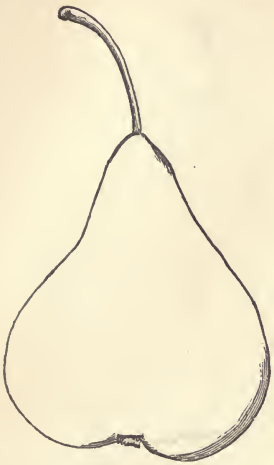

Fig. 271.—*Beurré Bosc.*

Fig. 272.—*Dupuy Charles.*

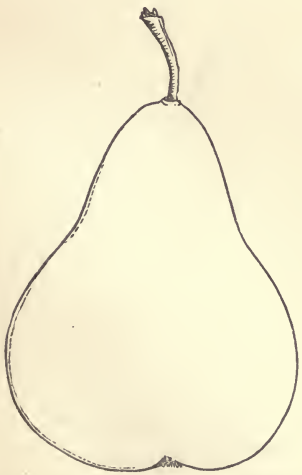

Fig. 273.—*Conseiller de la Cour.*

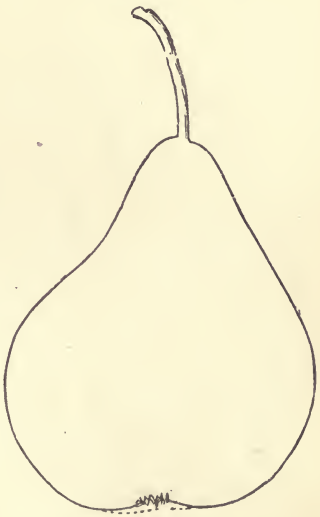

Fig. 274.—*Pound.*

PYRIFORM.—*Diel-shaped.*

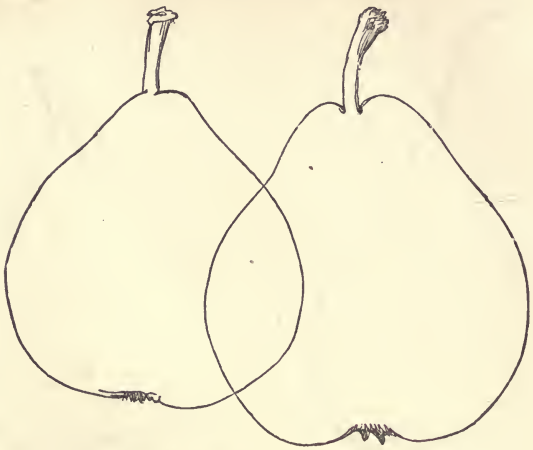

Fig 275.—*Doyenné du Comice.* Fig. 276.—*Beurré Diel.*

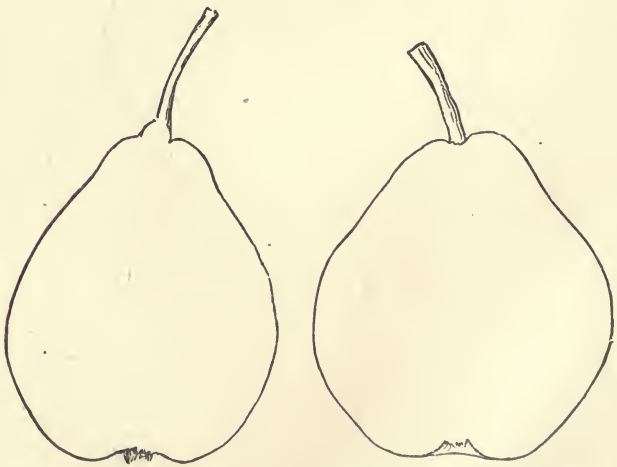

Fig. 277.—*Onondaga.* Fig. 278.—*Black Worcester.*

PYRIFORM.—*Tyson-shaped.*

Fig. 279.—*Brandywine* (two outlines).

Fig. 280.—*Las Canas.*

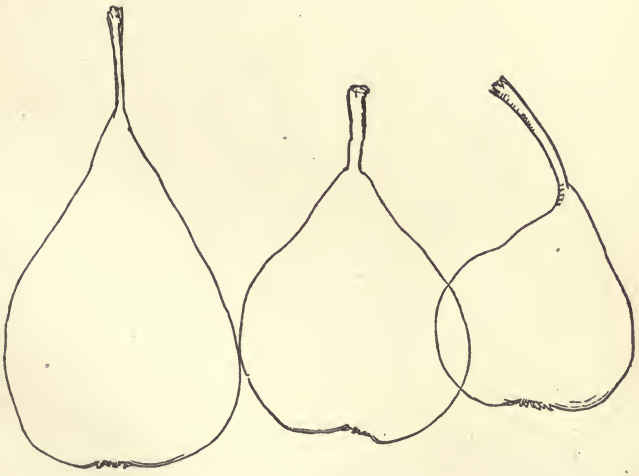

Fig. 281.—*Wilmington.* Fig. 282.—*Rosabirne.* Fig. 283.—*St. Ghislain.*

OBOVATE-PYRIFORM.—*Urbaniste-form.*

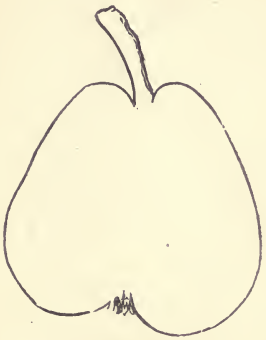

Fig. 284.—*Urbaniste.*

Fig. 285.—*Pratt.*

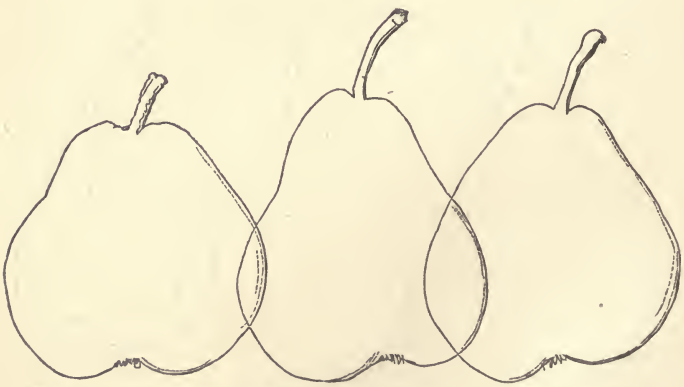

Fig. 286.—*Kingsessing.* Fig. 287.—*Beurré Kennes.* Fig. 288.—*Langelier.*

OBOVATE-PYRIFORM.—*Madeleine-form.*

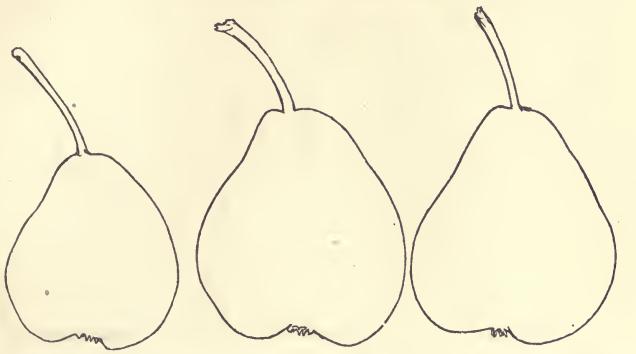

Fig. 289.—*Madeleine.* Fig. 290.—*Alpha.* Fig. 291 —*Inconnue Van Mons.*

OBOVATE.—*Doyenné-form.*

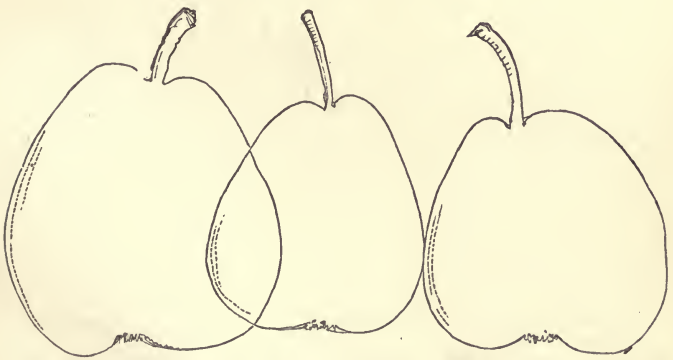

Fig. 292.—*Doyenné Boussock.* Fig. 293.—*Cushing.* Fig. 294.—*Doyenné Defais.*

OBOVATE.—*Buffum-shaped.*

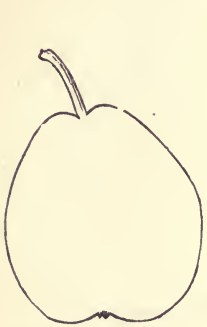

Fig. 295.—*Heathcot.*

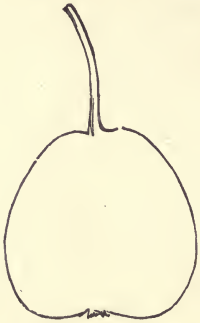

Fig. 296.—*Lewis.*

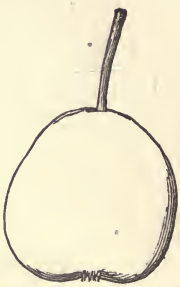

Fig. 297.—*Dearborn's Seedling.*

SHORT OBOVATE.

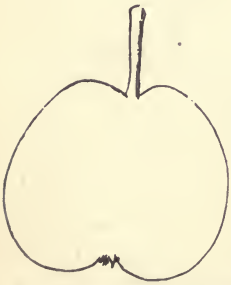

Fig. 298.—*Bergamotte Cadette.*

Fig. 299.—*Sieulle.*

Fig. 300.—*Beurré Gris d'Hiver.*

OBOVATE-TURBINATE.—*Bloodgood-shaped.*

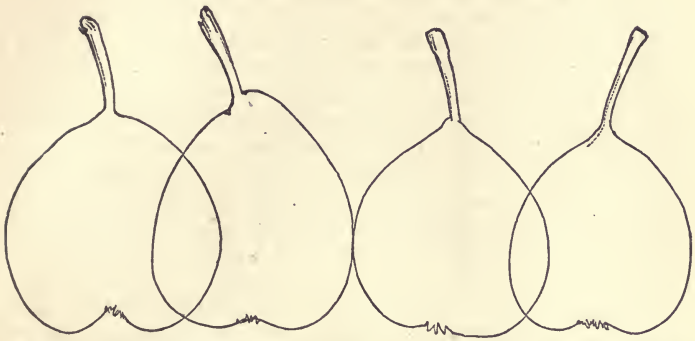

Fig. 301.—*Bloodgood.* Fig. 302.—*Henry IV.* Fig. 303.—*Dundas.* Fig. 304.—*Payency.*

OBLATE.—*Bergamot-shaped.*

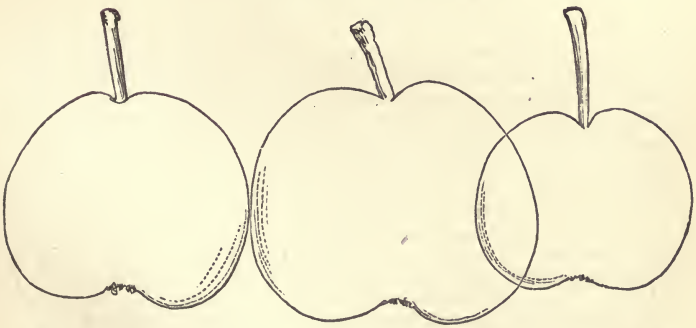

Fig. 305.—*Beurré Goubalt.* Fig. 306.—*Gansel's Bergamot.* Fig. 307.—*Fulton.*

The quality of pears is remarkably liable to change from external causes. A difference in soil and cultivation exerts so great an influence with many fine sorts, that while they possess the highest flavor when growing on favorable ground kept rich and mellow, they become greatly inferior or even worthless in poor soil with neglected culture. Besides these, there are other influences dependent on a change of locality, all of which taken together, have contributed to the great diversity of opinion which exists in relation to many celebrated varieties. The pomologist will hence perceive the difficulty of weighing evidence for and against the different sorts, and of expressing a degree of quality that shall coincide with the opinions of all.

It will be understood, that the quality given on the following pages, refers only to pears tested in this country. Some European varieties, which maintain a high character at home, prove of no value here.

In describing pears, it may be well to repeat that the term *base* applies in all cases to the part nearest the tree; and *apex*, to the part most remote. This is in accordance with universal practice among eminent botanists. The apex is usually termed the *crown;* and it is sufficiently evident that the crown (upper portion or surmounting part) cannot at the same time be the base.

DIVISION I.—SUMMER PEARS.

CLASS I.—DISTINCT PYRIFORM.

BARTLETT. (Williams' Bonchretien.) Quite large, obtuse-pyriform, somewhat pyramidal, surface wavy, clear yellow, sometimes a faint blush; stalk an inch and a fourth long, stout, slightly sunk; basin little or none; apex slightly plaited, sometimes smooth; flesh nearly white, fine grained, exceedingly tender and buttery, with a nearly sweet, sometimes faintly sub-acid, fine, moderately rich flavor. Ripens end of summer and beginning of autumn; and far north, is strictly an autumn pear. The fruit, when not fully grown, ripens and becomes of good quality if kept in the house a week or two. Growth erect, vigorous, leaves folded, slightly recurved, shoots yellowish. Tree very productive, and bears very young. Although not of the first class as to flavor, the many fine qualities of this pear render it a general favorite. Fig. 266.

BEURRÉ GIFFARD. Medium, pyriform slightly Bosc-shaped, but shorter, skin greenish yellow, marbled red on the sunny side; stalk rather long, calyx closed, basin small; flesh juicy, melting, slightly vinous, exceedingly agreeable. Middle of August. Shoots slender, reddish purple, growth straggling.

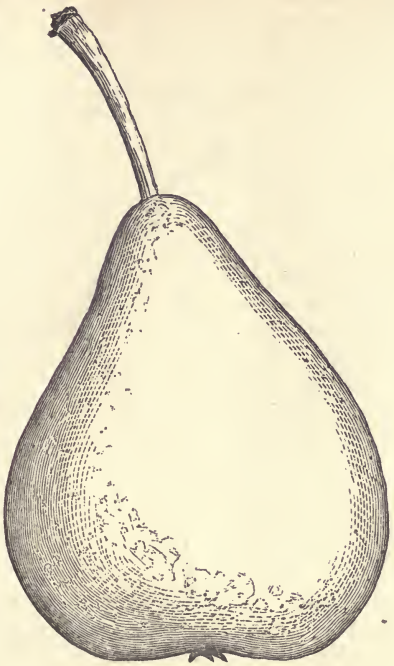

Fig. 308.—*Beurré Giffard.*

BRANDYWINE. Size medium; conic-pyriform (Tyson-shaped), neck acute; smooth, dull yellowish green, partly russeted, crown thickly russeted; stalk three-fourths to an inch and a half long, fleshy at insertion; flesh white, very juicy and melting, of fine flavor. Leaves rather small, shoots pale olive, vigorous, upright; tree not very productive. Ripens in August. A native of Delaware co., Penn. Grows well on the quince. Fig. 279.

Clapp's Favorite. Large, pyriform, body large tapering to the crown, neck rather small; skin smooth, yellowish green becoming yellow, dotted and shaded with red to the sun; stalk rather short, stout; calyx partly closed, basin small wrinkled; flesh greenish or yellowish white, juicy, melting, perfumed, of very good quality. Ripens end of August and beginning of September, or about a week before the Bartlett. Young shoots dark purple, growth strong and vigorous, resembling that of the Flemish Beauty, with which and the Bartlett it is supposed to be a cross. New and promising. Dorchester, Mass.

Julienne. Size medium; slightly pyriform, approaching obovate, regular; whole surface clear yellow; stalk an inch long, rather stout, cavity small; calyx small, erect or closed, basin rather shallow; flesh half buttery, sweet, of good flavor, but often poor on heavy soils. Late summer. Shoots yellowish. Productive, and bears when very young. Proves fine at the South.

MADELEINE. (Citron des Carmes, Magdelen, Green Chisel, *incorrectly.*) Medium in size, slightly pyriform, conic-obovate; skin smooth, pale yellowish green, rarely a faint brownish blush; stalk slender, an inch and a half long, cavity very narrow and small; basin shallow; flesh juicy and melting, usually faintly acid, with an agreeable, delicate, fine, refreshing flavor. Matures about midsummer, or at the time of wheat harvest. Needs house-ripening. Shoots straight, erect, greenish, growth vigorous; tree rather liable to blight. Leaves quite flat.

Fig. 309.—*Madeleine.*

Pulsifer. Medium or rather small, pyriform, Madeleine or Rostiezer-shaped; skin dull yellow, sometimes slightly russeted; stalk short, curved, slightly sunk; basin shallow; flesh juicy, melting, and when well ripened, of a very good flavor. Middle of August. Shoots greenish, rather erect. Illinois. New.

ROSTIEZER. Rather small, sometimes medium in size; conic-pyriform, approaching obovate, nearly Madeleine-shaped, regular; skin dull brownish green, with a dark, dull, reddish brown cheek to the sun, with whitish specks, and traces of thin russet; stalk an inch and a half to two inches long, slender, scarcely sunk; basin little or none; flesh juicy, melting, sweet, with a very high, perfumed flavor, of high excellence. Ripens late in summer. For rich flavor, it has scarcely an equal among summer pears. Shoots dark, large, leaves broad.

Skinless. (Sanspeau.) Rather small, long pyriform, body conic-ovate, regular; skin smooth, very thin, yellowish green, often dot-

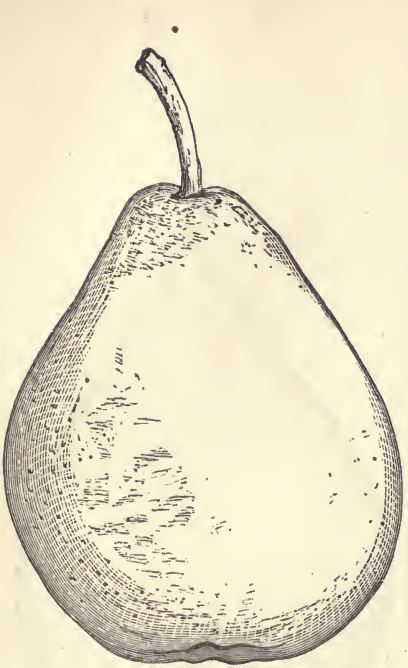

Fig. 310.—*Pulsifer.*

Fig. 311.—*Rostiezer.*

ted with reddish brown in the sun; stalk about an inch and a half long, slender, curved, cavity very small; calyx closed or erect, basin minute, slightly ridged; flesh half melting, juicy, with a sweet, slightly perfumed, good flavor. Ripens immediately after the Madeleine, or two weeks after harvest. Growth very vigorous, erect, leaves flat, wavy. A profuse bearer; fruit always fair.

Supreme de Qumeper. Medium or small, conic-obovate, yellow, shaded with red; stalk short, obliquely set, not sunk; calyx partly open, basin shallow; juicy, melting, perfumed. First of August. Becomes dry if not picked early. Shoots dark purple, rather erect.

Tyson. Size medium, conic-pyriform, sometimes approaching obovate; bright yellow, with a reddish brown softly shaded cheek, often some russet; stalk an inch and a fourth long, inserted into a fleshy prominence abruptly contracted from the rounded neck; basin very shallow, even; flesh of fine texture, buttery, very melt-

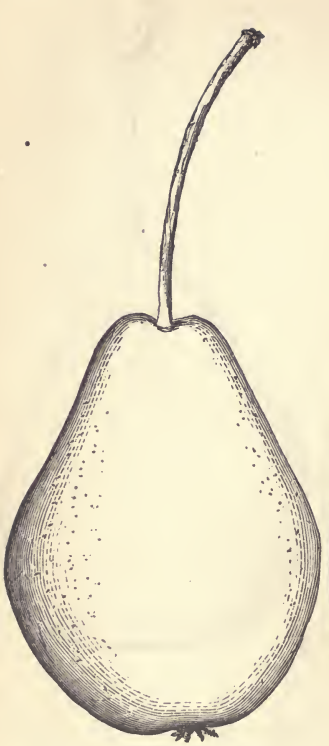

Fig. 312.—*Skinless.*

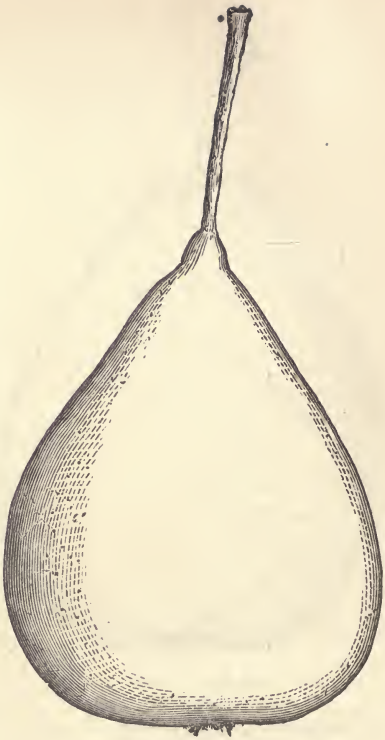

Fig. 313.—*Tyson.*

ing, juicy; flavor nearly sweet, aromatic, slightly perfumed, excellent. Ripens the last two weeks of summer. Shoots quite dark brown, erect, vigorous. The tree does not come soon into bearing. Penn.

Class II. Obscure Pyriform, Obovate or Turbinate.

Bloodgood. Size medium; turbinate, approaching obovate, base contracted abruptly to the stalk; yellow, touched with russet; stalk fleshy at insertion, an inch and a fourth long, set on the rounded base without depression; calyx scarcely sunk; flesh yellowish white, buttery and melting, with a fine, rich, aromatic flavor. Sometimes rots at the core. On some soils the flavor becomes poor and insipid. Ripens middle of August. Like all

early pears, it is best if house-ripened. Origin, Long Island, N. Y. Fig. 301.

DEARBORN'S SEEDLING. Scarcely medium in size, obovate or Bufum-shaped, regular, smooth; surface clear yellow, with minute specks; stalk an inch long, sunk little or none; basin very shallow; flesh very fine grained, juicy, melting, and of fine flavor. Ripens nearly with the Bloodgood, or middle of August. Shoots straight, long, dark brown. Tree bears when young. Fig. 297.

Edward's Henrietta. Size, a little below medium; obovate, crown flattened; stalk set on the rounded point of the neck; skin smooth, pale yellowish green, dots few; stalk an inch and a half long, cavity small or none; calyx closed, basin shallow, faintly plaited; melting, juicy, sub-acid, with a good second-rate flavor. Very productive. Late summer. Origin, New Haven, Conn.

Limon. (Hagerston.) Size medium; obovate, sometimes slightly pyriform; light yellow, with a reddish brown blush; stalk an inch and a half long; cavity round, even, shallow; calyx slightly sunk; flesh buttery, melting, of fine texture, with a mild, sweet flavor slightly perfumed. Late summer. Shoots long, slender, reddish brown. Belgian.

MANNING'S ELIZABETH. Small, obovate, Seckel-form, smooth; surface clear yellow, with a lively blush; stalk one inch long, cavity round, shallow; flesh very melting, saccharine, sprightly, perfumed, excellent. End of summer. Shoots diverging, dark reddish brown, serratures of the leaves very slight. Belgian.

Moyamensing. Medium or large, sometimes quite large, variable; round-obovate, rather irregular; skin lemon yellow, sometimes marked with russet; stalk nearly an inch long, fleshy; basin furrowed; flesh buttery, melting, good, but not first-rate. Ripens from midsummer till autumn, quickly decays. Productive. Origin, Philadelphia.

Muscadine. Size medium; short obovate, regular, sometimes slightly oblique; surface a little rough, yellowish green, thickly dotted; stalk an inch and a fourth long, rather stout, cavity very small, even; basin rather wide, shallow; flesh buttery, melting, a little coarse, rather rich, slightly musky, faintly astringent, moderately good. Late summer, and early in autumn. Shoots rather thick.

OSBAND'S SUMMER. (Summer Virgalieu, *erroneously*.) Medium in size, often rather small, obovate, regular, smooth and even (Doyenné-shaped); sometimes remotely pyriform; greenish yellow becoming yellow, with a reddish brown cheek, often faintly russeted; stalk three-fourths to one inch long, slightly sunk in a nearly even cavity; calyx erect, in a round, nearly even, or slightly wrinkled basin; flesh white, granular, with a sweet, mild, and fine flavor; soon loses its flavor when mature. Ripens

early in August. Shoots yellowish olive, thick. Origin, Wayne co., N. Y.

OTT. Small, roundish-obovate, or short Seckel-form; greenish yellow, russeted in part, rarely a mottled red cheek; stalk an inch and a fourth long, cavity small; calyx rather large, basin shallow; flesh melting, rich, perfumed, aromatic, closely resembling that of its parent the Seckel. Ripens quite early, or by the first or middle of August. Shoots rather erect, brownish green, leaves like Seckel. Origin, Montgomery co., Pa. (The figure is larger than average size.)

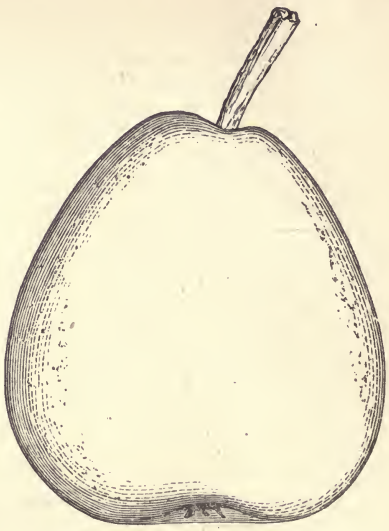

Fig. 314.—*Osband's Summer.*

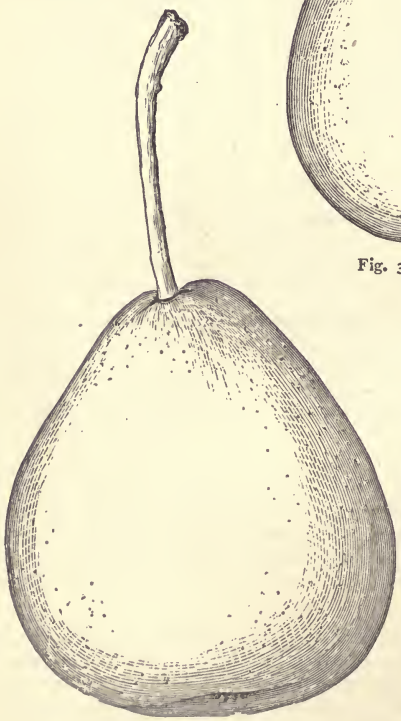

Fig. 315.—*Ott.*

Pinneo, or Boston. Size medium, obovate, slightly oblong, smooth, yellow when ripe, russeted around the stalk, which is long, straight, slightly sunk; basin moderate, wrinkled; flesh juicy, melting, pleasant, sweet, somewhat aromatic. Flesh dry, unless picked early. Late Aug. Shoots rather erect, light reddish brown.

SUMMER DOYENNÉ. (Doyenné d'Eté.) Small; round obovate, or

short Buffum-shaped; stalk an inch or an inch and a fourth long, rather stout, slightly oblique, not sunk; basin very shallow; skin a fine yellow, with a warm cheek brightly reddened at the crown, and with radiating stripes of greenish yellow from the calyx; flesh

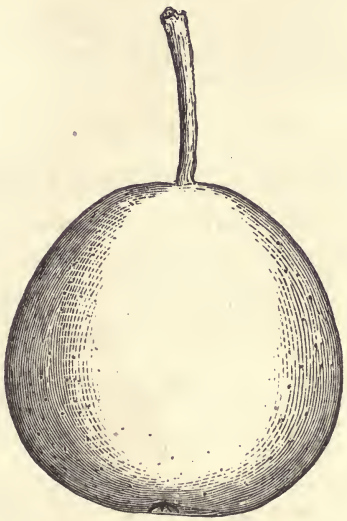

Fig. 316.—*Doyenné d'Eté.*

melting, juicy, sweet, with a pleasant, very good flavor. Skin thin; core small; seeds small, white. Ripens latter part of July. Tree bears very young. Shoots slender, reddish brown.

*Uwchlan.** Medium, obovate, sometimes roundish, skin yellow, much russeted; stalk rather long, sunk little or none, basin shallow; flesh of fine texture, buttery, melting, with a rich, aromatic, very good flavor. End of August. Chester co., Pa. New.

Class III.—Roundish or Oblate.

Duchesse de Berry d'Eté. Small, roundish, sometimes oblate, occasionally approaching obovate; yellow, sometimes shaded light red; stalk short, slightly sunk, basin shallow; juicy and melting, flavor "very good." End of August. Shoots stout, light greenish.

Muskingum. Medium, roundish; greenish yellow, thickly dotted;

* Pronounced Yook'lan.

stalk long, cavity small; basin shallow; flesh melting, pleasant, perfumed. End of Aug.

Summer Portugal. (Passans du Portugal.) Size rather small, often nearly medium, roundish-oblate, regular; skin yellowish green or pale yellow, with a handsome red cheek in the sun, formed of the reddened dots; stalk about an inch long; calyx stiff, erect; cavity and basin shallow; flesh white, breaking, tender, juicy, moderately good. Late summer. Very productive. Shoots upright, reddish brown.

DIVISION II.—AUTUMN PEARS.

Class I.—Distinct Pyriform.

Adams. Large, pyriform; deep yellow, smooth, shaded red next the sun; stalk short, stout, wrinkled at base; scarcely sunk, eye small, closed, even with the crown; flesh white, fine, melting, rich, vinous, perfumed. Sept. and Oct. Shoots dark brown, tree upright. Mass.

Alpha. Size medium, pyriform, obovate or Madeleine-shaped, smooth; pale yellowish green, with a faint brown blush; stalk slightly sunk, basin moderate; fine grained, buttery and good. Oct. Belgian. Fig. 290.

Ananas d'Eté. Rather large, obtuse-pyriform; skin smooth, clear yellow, with numerous small dots, often with a blush; stalk stout and fleshy, basin small; flesh fine grained, buttery, and melting, sweet and very good. Early autumn. Growth somewhat irregular, shoots brownish purple.

Andrews. (Amory, Gibson.) Medium or rather large, distinct pyriform, often slightly one-sided; skin thick, dull yellowish green, with a broad, dull red cheek; stalk about an inch long, curved, scarcely sunk; basin shallow, sometimes deep; flesh greenish, very juicy, melting, of a fine, pleasant, agreeable flavor. On some localities not first-rate. Ripens early in autumn. Very productive and fair. Shoots diverging. Origin, Dorchester, Mass.

Autumn Paradise. (Paradise d'Automne.) Rather large, distinct pyriform; surface uneven, yellowish orange, with some thin russet patches; stalk an inch and a half long, not sunk; basin small, irregular; flesh melting, very buttery, with a rich, high, and excellent flavor. Ripens about mid-autumn. Shoots yellowish, at first upright, afterwards becoming straggling, growth vigorous. This pear resembles the Beurré Bosc, but is less smooth, more irregular in form, has a less narrow neck, and more vigorous growth. Shoots yellowish brown, speckled, irregular, leaves finely serrated, slightly wavy.

Barry. Medium, pyriform, irregular; yellow, rough, spotted red on sunny side; stalk short, obliquely set; calyx small, basin narrow; rather coarse, juicy, rich, perfumed. An excellent fruit. Oct.

Baronne de Mello. (Adele de St. Denis.) Medium, conic-pyriform (often Tyson-shaped), sometimes obovate or turbinate, variable; skin rough, much russeted; stalk fleshy at insertion; flesh rather coarse, very juicy and melting, vinous or sub-acid, of moderate quality. Oct. Tree vigorous, a great bearer.

Bergen Pear. Large, pyriform, sometimes approaching obovate or turbinate, smooth; yellow, with a handsome cheek; stalk curved, slightly sunk; calyx and basin small; fine grained, buttery, melting, sweet, excellent. Last of Sept. Long Island.

Beurré Bachelier. Rather large, obovate, pyriform, irregular; green; stalk rather short, obliquely set; calyx partly closed, basin shallow; buttery, melting, vinous, aromatic, flavor moderate. Nov., Dec. Shoots reddish yellow, vigorous. Large, well grown specimens are sometimes nearly Bartlett-shaped, small ones approach roundish-obovate. Bark of the tree cracks.

Beurré Bosc. (Calebasse Bosc.) Large, very distinct pyriform, neck rather long and very narrow, acute, body broad; surface nearly smooth, deep yellow, russeted in patches; stalk an inch and a half long, slender, curved; basin very shallow; flesh juicy, buttery, rich, perceptibly perfumed, sweet, excellent. Mid-autumn. Growth moderate, a regular, even bearer. Fails on quince stocks. Belgian. Fig. 271.

Beurré Diel.* (Diel, Diel's Butter.) Large, sometimes very large, thick pyriform, neck short, obtuse, body very large; small specimens approach obovate; skin dull yellow, with numerous conspicuous dots, and some russet; stalk an inch and a fourth to an inch and a half long, stout, moderately sunk; basin slightly furrowed; flesh rather coarse, rich, sugary, buttery, juicy, fine. Late autumn and early winter. Shoots large, spreading, irregular; leaves roundish or broad. Succeeds well on quince stocks. Belgian. Fig. 276.

Beurré Duval. Medium, obtuse pyriform or Bartlett-shaped; pale green; buttery, melting, with good flavor. Oct., Nov. Productive. Fig. 267.

Beurré Kennes. Medium, pyriform, somewhat Urbaniste-shaped; greenish yellow, russeted; stalk thick, fleshy at insertion; calyx partly closed; basin broad, shallow; buttery, melting, sweet, rich, perfumed. Excellent. Oct. Must be house ripened. Fig. 287.

Beurré Moire. Rather large, pyriform, approaching obovate; greenish yellow; stalk stout, curved, cavity uneven, basin shallow;

* Pronounced Deel.

flesh yellowish, slightly granular, buttery, melting, rich, variable, often very good. Oct. Shoots purple, leaves wavy.

Beurré Nantais. (Beurré de Nantes.) Large, long pyriform or pyramidal; greenish yellow, with a red cheek; stalk large, set under a lip, not sunk; calyx large, in a broad, furrowed basin; juicy, perfumed, very good. Oct.

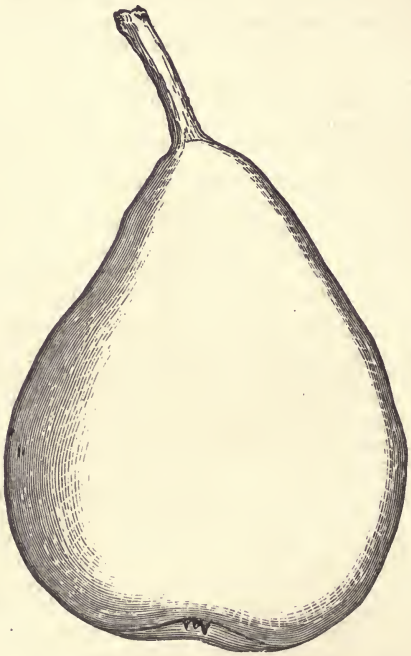

Fig. 317.—*Beurré Nantais.*

Beurré Soulange. Rather large, acute or conic, pyriform, or with neck tapering into stalk, which is stout, curved, and fleshy; pale yellow, with traces of russet; basin and calyx rather large; melting, very juicy, rich, aromatic. Sept., Oct.

Beurré Sterkmans. (Sterkmans, Doyenné Sterkmans.) Size medium, short pyriform, broad at the crown, slightly ribbed; skin greenish yellow, dotted and shaded red to the sun; stalk an inch or more long; cavity small, uneven; basin rather large, uneven; flesh fine grained, buttery, and melting, with a very good, slightly vinous flavor. Late autumn.

Canandaigua. Rather large, pyriform, somewhat irregular (Bartlett-shaped); lemon yellow; stalk rather short, oblique; basin small; flesh buttery, melting, rather rich. Sept. Shoots strong, erect, light purplish red.

Capiaumont. (Beurré de Capiaumont.) Size medium, conic-pyriform, or Tyson-shaped, quite acute, approaching turbinate, regular; skin smooth, yellow, with cinnamon red to the sun, distinctly dotted, slightly russeted; calyx widely reflexed, not sunk; stalk about an inch long, but varying; flesh white, buttery, melting, moderately juicy, sweet, often astringent, about second quality. Hardy and productive. Leaves folded, recurved. Ripens about mid-autumn. Belgian.

Compte de Paris. Size medium, pyriform, approaching obovate, regular; skin thick, somewhat rough, bright green, becoming yellow at maturity; flesh nearly white, buttery, melting, juicy, with an agreeable perfume. Ripens in October, and continues in use a long time. One of Van Mons' seedlings. The tree is vigorous, with a stout erect growth, and appears to succeed well on the quince.

Chancellor. Large, obtuse pyriform, large specimens nearly Bartlett-shaped, small ones obovate; green; stalk an inch long, rather thick; cavity small, irregular; calyx small, basin contracted; flesh melting, rich, agreeable. Mid-autumn. Germantown, Penn.

Compte de Flandre. Rather large, pyramidal-pyriform, often oblique; skin yellow, with small dots and thin russet; stalk long, set under a lip, with a little depression; basin shallow; flesh juicy, melting, with an agreeable, refreshing flavor, very good. Nov.

Conseiller de la Cour. (Marechal de la Cour.) Large, pyriform (somewhat Bosc form); greenish yellow, slightly russeted; stalk slender, not sunk; basin small, calyx small, nearly closed; flesh white, melting, sub-acid, juicy, of fine quality. Late autumn and early winter. Tree vigorous, productive. Succeeds on quince. Foreign. Fig. 273.

Countess of Lunay. Size medium, obovate-pyriform, somewhat conic; skin smooth, pale waxen yellow, with a thin red cheek; stalk about an inch and a half long, set without depression on the rounded point of the neck, which is slightly russeted; basin very small, even; flesh white, very juicy, melting, fine, very good. Mid-autumn.

De Tongres. (Durandeau.) Large, pyramidal-pyriform, surface uneven or knobby; yellow, with bronze russet and red stripes; juicy, melting, rich, sub-acid, perfumed. Oct., Nov. A large, handsome, and excellent pear, but the tree is rather tender Shoots light brown, slender, spreading, leaves narrow.

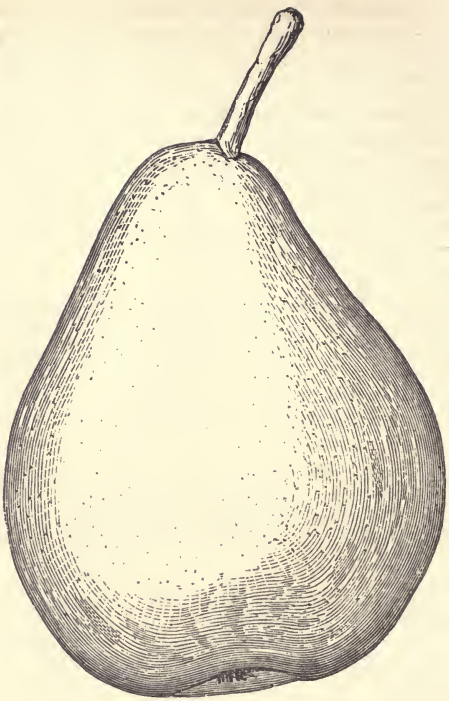

Fig. 318.—*Compte de Flandre.*

Dix. Large, long pyriform, body round-ovate, tapering slightly to the often oblique and slightly flattened and obtuse crown; yellowish green, becoming deep yellow; dots numerous, distinct; stalk an inch and a quarter long, stout at each end, slightly sunk; basin small; flesh rather granular, rich, juicy, sweet, often excellent, sometimes rather acid. The fruit often cracks. Middle and late autumn. A tardy bearer. Shoots yellow, rather slender, often thorny; leaves flat. A native of Boston, Mass.

Doyenné du Comice. Rather large, roundish-pyriform, somewhat pyramidal; greenish yellow, becoming fine yellow at maturity, often with a faint crimson blush, slightly russeted, thickly dotted; stalk short, stout, set obliquely in a small cavity; calyx small, in a deep, uneven basin; flesh white, fine, melting, with a sweet, rich, slightly aromatic flavor. Keeps long after fully ripe. Oct. and Nov. Young wood apt to be injured. Fig. 275.

Duc de Brabant. (Waterloo, Meil de Waterloo, Fondante de Charneuse, Beurré Charneuse, Belle Excellente, Excellentissima.) Large, roundish-pyriform, tapering to crown (somewhat Onondaga-shaped), neck small; greenish, dotted green, shaded crimson on the sunny side; stalk long, curved, scarcely sunk; basin irregular, ribbed; flesh greenish white, buttery, and melting, with a refreshing vinous flavor. Oct., Nov.

Duchesse d'Angouleme. Very large, very obtuse-pyriform, sometimes oblong-obovate, surface uneven; greenish yellow, often some russet; stalk an inch to an inch and a half long, very stout; cavity deep, often wide; calyx small, basin uneven; flesh yellowish white, melting, buttery, juicy, very good when well grown, poor or worthless when small; succeeds admirably and is best on quince stock. It has been remarked that when this pear weighs less than four ounces it is worthless in flavor. Ripens mid-autumn and later. French.

Duchesse d'Orleans. Large, often only medium, sometimes long pyriform, but usually obovate-pyriform, somewhat pyramidal; skin golden yellow, slightly russeted, sometimes nearly overspread with russet, with a red cheek; stalk thick, about an inch and a half long, scarcely sunk; basin small, even; flesh buttery and melting, rich; when well ripened, delicious. Ripens mid-autumn. A handsome, fine, French variety. Growth rather spreading, shoots yellowish green.

Dumas. (Belle Epine Dumas, Duc de Bordeaux.) Medium, long pyriform; greenish yellow; stalk long, scarcely sunk; basin shallow, regular; calyx partly closed; buttery, half melting, sweet, flavor peculiar. Late autumn. Growth vigorous, succeeds on quince. Shoots dark, speckled, leaves narrow.

Emile d'Heyst. Large, long pyriform (like the Winkfield); light green with some brown russet; stem variable, rather long, sometimes fleshy; calyx small, basin narrow, deep, and knobby; buttery and melting, fine, perfumed. Nov. Shoots long, brownish yellow, diverging and straggling. Fig. 268.

Figue. Medium or rather large, pyriform-pyramidal, regular, body rounding to the apex; skin thin, green, partly russeted at crown, often a dull red cheek, stalk an inch long, stout, very fleshy at insertion, not sunk; basin none; flesh rather coarse, melting, juicy, rich, high flavored. Late autumn.

Figue d'Alençon. Large, irregularly pyramidal or pyriform; green, spotted with russet; flesh melting, juicy, vinous, sprightly, excellent. Oct. to Dec. Tree vigorous, productive. Shoots reddish purple, leaves thick.

Forelle. (Trout Pear.) Medium or rather large, pyriform, approaching oblong-obovate; green, becoming clear yellow, with a deep ver-

milion cheek, dots margined with crimson; stalk an inch long, slender, cavity moderate; basin rather abrupt and narrow; flesh buttery and melting, but not rich. Late autumn. Shoots dark, purplish; leaves small, nearly flat. German. A pear of great beauty, which has contributed to its reputation.

Graslin. Large, pyramidal-pyriform, often tapering to the crown; skin thick, green, slightly russeted; stalk long, slightly sunk; basin furrowed, flesh coarse, buttery, melting, rich, vinous. Oct., Nov.

Harvard. Medium or rather large, oblong-pyriform; skin russety olive yellow, and with a reddish cheek; stalk rather stout, sunk little or none, oblique; basin narrow; flesh juicy, melting, tender; rots at the core if not house-ripened. First of autumn. Very productive, growth vigorous, fruit handsome, rendering it profitable for market, although only second-rate in quality. Origin, Cambridge, Mass.

Lodge. Medium, pyriform, neck small, narrow, very acute, sometimes ribbed and irregular; greenish brown, much russeted; stalk long, rather stout, curved; basin varying from shallow to deep; flesh juicy, melting, with a rich, vinous, sub-acid, Brown Beurré flavor. Early and mid-autumn. Phila., where it proves very good, but further north does not stand so high. Shoots slender, yellowish brown, erect, and diverging.

Long Green. (Verte Longue.) Rather large, long-pyriform, the ends rather acute, stem oblique; surface wholly green; flesh very juicy, with a good and agreeable flavor. The Striped Long Green is a sub-variety.

The Long Green of Autumn (Verte Longue d'Automne, or Mouth-water) is quite distinct, being smaller, much more rounded, stem long, and with a brown cheek; very juicy and pleasant; ripens late in autumn, a month after the preceding. Profusely productive, and valuable.

Louise Bonne of Jersey. (Louise Bonne de Jersey, Louise Bonne d'Avranches.) Large, pyriform, tapering slightly to obtuse or flattened crown; slightly one-sided; surface smooth, pale yellowish green, with a brownish red cheek; stalk an inch to an inch and a half long, often fleshy at insertion, little sunk; basin shallow; flesh yellowish white, very juicy, buttery, melting, rich, faintly sub-acid, fine. Ripens mid-autumn; late autumn far north, early autumn at Cincinnati. Very productive; succeeds admirably and grows with great vigor on quince stocks. Shoots dark brown or purple; serratures of the leaves rather coarse. This fine variety, like the Bartlett, is hardly of the highest quality, but is eminently valuable for its large, fair fruit, free upright growth, and great productiveness.

Madame Eliza. Large, pyriform, approaching pyramidal; skin

green, becoming nearly yellow; flesh buttery, melting, sweet, perfumed, agreeable. Nov. Shoots greenish brown, erect. Belgian.

Marie Louise. Large pyriform, a little one-sided, or with a curved axis; body somewhat conical; surface pale green, becoming yellowish, partly russeted; stalk an inch and a half long, rather stout, often oblique; calyx small, basin narrow, plaited; flesh buttery, melting, vinous, when well grown rich and fine—often second or third rate—variable. Needs rich cultivation or else the fruit will be poor. Mid-autumn. Growth very flexuous and straggling, shoots olive grey, petioles very long, leaves narrow. Belgian.

Millot de Nancy. Medium or below, distinct pyriform, orange russet on dull yellow; stalk an inch long, not sunk; flesh buttery and melting, moderately juicy, and rich, sweet, aromatic. Oct., Nov. Belgian.

Napoleon. Medium or rather large; conic-pyriform, obtuse, variable; green becoming pale yellowish green; stalk an inch long, stout, slightly sunk; basin rather large; flesh uncommonly juicy, melting, moderately rich, good, often astringent and worthless. From mid-autumn till winter. Needs ripening in a warm room. Very productive, thrifty, hardy. Shoots rather erect. Belgian. Best on warm light soils.

Nouveau Poiteau. Medium or large, conic-pyriform, sometimes approaching obovate, greenish, much russeted, and thickly dotted; stalk rather short, often fleshy at insertion, not sunk; calyx closed, basin moderate; flesh buttery, melting, somewhat vinous, very good when well grown. Nov. A strong grower, shoots brownish red, and forms a handsome pyramid on quince. Belgian.

Onondaga. (Swan's Orange.) Quite large, obtuse oval-pyriform, nearly in the form of a double cone, neck very short and obtuse, body large and tapering to obtuse apex; skin roughish, greenish yellow, becoming rich yellow, dots numerous, often a slight brown cheek, crown often slightly russeted; stalk an inch to an inch and a half long, stout, slightly sunk; calyx small, closed, basin narrow, ribbed; flesh slightly coarse, buttery, melting, sometimes a little breaking, juicy, rich, fine, but not of the highest quality, sometimes astringent. Ripens mid-autumn. Growth vigorous, shoots yellow, ascending. Productive. Fig. 277.

Ontario. Medium or rather large, oblong-pyriform (somewhat Bartlett-shaped, but more obovate), sometimes faintly ribbed, somewhat irregular; pale yellow, thickly dotted; stalk an inch long; cavity small, irregular; calyx open or partly closed; basin wrinkled; flesh buttery, melting, with a mild, pleasant, agreeable flavor. First of October. Shoots yellowish red, rather erect. Geneva, N. Y.

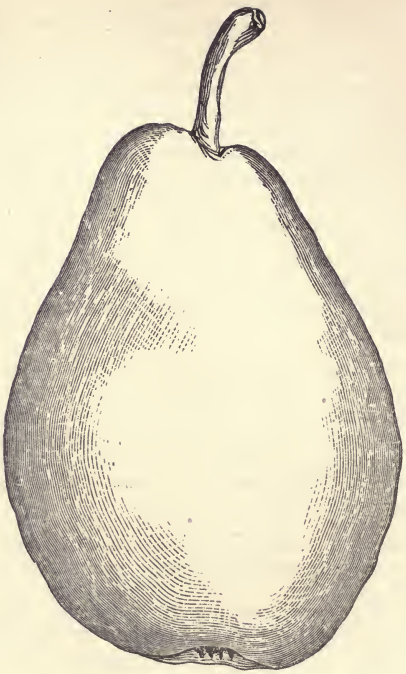

Fig. 319.—*Ontario.*

Payency. (Paquency.) Size medium; pyriform approaching obovate-conic (Tyson-shaped); skin dull yellow, slightly russeted, with a faint dull blush; stalk an inch long, stout; calyx erect, basin shallow; flesh white, juicy, melting, good. Mid-autumn. French.

Parsonage. Medium or large, pyramidal-pyriform, approaching conic-obovate, skin orange yellow, partly russeted, thickly dotted; stalk short, thick; cavity small; calyx partly open, basin shallow; flesh granular, melting, juicy, rich. Sept. New Rochelle, N. Y.

PRATT. Medium or rather large, obovate-pyriform, skin greenish yellow, thickly dotted; stalk an inch long, slender and moderately sunk; basin wide, shallow; flesh tender, melting, juicy, excellent. Early autumn. Shoots yellowish, erect, leaves rather narrow, recurved. Rhode Island. Fig. 285.

Queen of the Low Countries. Large pyriform, neck narrow, body

broad or slightly oblate (Bosc-shaped); surface slightly uneven, dull greenish yellow, crown russeted, with numerous, often confluent russet dots, and a slight blush; stalk an inch and a half long, curved, not sunk; calyx small, rather deep set, basin ribbed; buttery, melting, juicy, moderately rich, sub-acid, with a second-rate, Brown Beurré flavor. Mid-autumn. Belgian.

St. Ghislain. Size medium; pyriform, neck narrow, acute, tapering; surface pale yellow, sometimes a faint blush; stalk an inch and a half long, curved with fleshy rings at insertion; basin very shallow; flesh white, buttery, juicy, with a fine flavor. Growth upright, vigorous, shoots light brown. Somewhat variable in quality. Belgian. Early autumn. Requires high cultivation. Fig. 283.

St. Michel Archange. (Plombgastel.) Rather large, pyramidal-pyriform, greenish yellow, thickly dotted, partly russeted; stalk medium length, stout, fleshy at insertion, not sunk; calyx closed, basin small, uneven; flesh rather coarse, juicy, rich, aromatic. October. Shoots greenish, quite erect, leaves narrow, light green. Tardy bearer.

Selleck. Large, obtuse-pyriform (Diel-shaped), ribbed; fine yellow, thickly dotted; stalk long, curved, fleshy at insertion; cavity moderate, calyx closed; basin small, uneven; flesh white, juicy, melting, rich, aromatic, excellent. Sept., Oct. Shoots slender, brownish yellow.

Soldat Laboureur. Rather large, pyriform; skin becoming yellow when ripe, slightly russeted; stalk rather stout, curved, slightly sunk; cavity small, abrupt; basin small; flesh granular, melting, juicy, and when well grown of a rich, vinous flavor; variable, often poor. Late autumn. Shoots erect, light greenish brown. Belgian.

Souvenir d'Esperen. Large, pyriform, obovate, tapering to crown, dull yellow, with a mottled red cheek; melting, vinous. Shoots yellow, erect. Nov. Belgian.

Theodore Van Mons. Rather large, obovate-pyriform, sometimes long pyriform; greenish yellow, somewhat russeted; stalk an inch long, scarcely sunk; calyx large, open; flesh granular, juicy, melting, varying from good to very good. Sept., Oct. Tree vigorous and productive on pear or quince.

Triomphe de Jodoigne. Quite large, obtuse-pyriform, irregular and uneven; skin rough, thick, greenish yellow, with russet dots; stalk large; calyx partly closed in a small basin; flesh coarse, juicy, buttery, musky, of moderate quality. Late autumn, keeps into winter. Growth vigorous, spreading, irregular.

Urbaniste. (Beurré Piquery.) Medium or rather large, conic-pyriform, obtuse and short, often approaching obovate; skin pale yellow or greenish, faintly russeted; stalk an inch long, stout, moderately and sometimes considerably sunk; calyx erect or

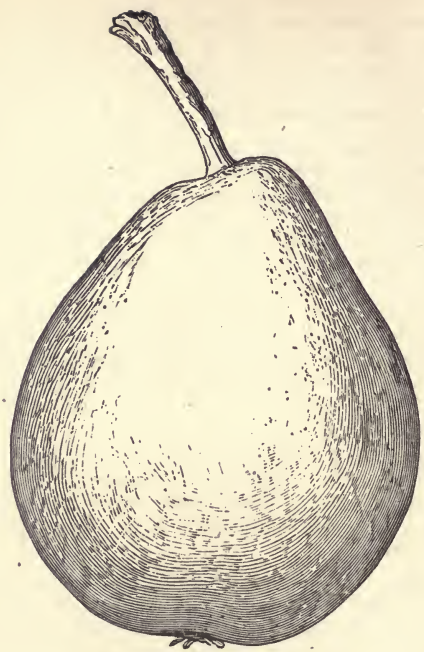

Fig. 320.—*Theodore Van Mons.*

closed; basin distinct, even; flesh melting, buttery, with a fine, delicious flavor, and a perceptible shade of acid. In unfavorable localities, it is sometimes of moderate quality. Middle and late autumn. Does not come soon into bearing. Shoots slender, greenish yellow, leaves narrow, recurved. Flemish. Fig. 284.

Verte Longue of Angers. Large, distinct pyriform (nearly Bosc-shaped), green, stalk rather short, oblique, not sunk, basin rather small, flesh greenish white, juicy and melting, agreeably perfumed. Oct. Belgian. Resembles Long Green (or *Verte Longue*). Fig. 270.

Van Mons Leon Le Clerc. Large, long pyriform, obtuse; surface yellowish green, slightly russeted; stalk an inch and a fourth long, stout, little sunk; calyx small, basin very shallow; flesh fine grained, yellowish white, buttery, melting, rich, fine. Ripens middle and late autumn. A native of Laval, in France. The value of this fine pear is nearly destroyed by its liability to crack and canker.

Wilmington. Medium, pyriform, approaching obovate, cinnamon

russet on yellow ground; cavity slight, often none; basin rather large; flesh fine, melting, buttery, rich, aromatic. Sept. Phila. Fig. 281.

CLASS II.—OBSCURE PYRIFORM, OBOVATE, OR TURBINATE.

Abbott. Medium in size, oblong-obovate (like the Washington), surface even, smooth, dark dull green, with a reddish brown cheek changing to scarlet; stalk an inch long; calyx small, closed; melting, juicy, rich. Early mid-autumn. Good and handsome, shoots purplish. Providence, R. I.

Augustus Dana. Medium or large, obovate; skin dull green, slightly rough, partly russeted, thickly dotted; stalk long, curved, scarcely sunk on the obtuse end; eye large, slightly sunk; flesh juicy, melting, rich, aromatic. Oct. and Nov. Growth irregular, thorny, like Dix. Mass. New.

Auguste Royer. Medium, turbinate; skin russet-fawn, becoming orange; juicy, rich, perfumed. Nov. Vigorous and productive.

BELLE LUCRATIVE, or FONDANTE D'AUTOMNE. Size medium, conic-obovate, sometimes remotely pyriform; surface pale yellowish green, slightly russeted; stalk an inch and a quarter long, often fleshy, oblique; cavity very small and narrow; calyx short; basin smooth, sometimes furrowed; flesh very juicy, with a fine texture, melting, rich, excellent. Variable—when well grown and fully ripened, it has no superior and few equals, in its exceedingly rich, delicate, perfumed flavor—but sometimes of poor quality. Middle or last of Sept. Belgian. Growth moderate, upright, shoots yellowish grey.

Bergamotte Cadette. (Beauchamps, Beurré Beauchamps, Poire de Cadet.) Size medium, round-obovate, or round-oval; surface greenish yellow, often russeted, frequently tinged with reddish brown to the sun; stalk an inch and a fourth long, scarcely sunk on the rounded base; calyx erect or closed, basin very shallow; flesh melting, buttery, juicy, sweet, quite rich, slightly perfumed; Late autumn. Shoots greenish, slender, erect, and diverging; leaves small. Productive. French. Fig. 298.

Beurré Berkmans. Medium, turbinate, or short pyriform; yellowish, rough, russeted; stalk fleshy, oblique, basin shallow, furrowed; buttery and melting, rich, and perfumed. Nov., Dec.

Beurré d'Amalis. (Beurré d'Amanlis.) Large, obovate, often irregular, sometimes slightly pyriform, with a short and narrow neck; dull yellowish green, with some russet, and a dull reddish cheek; stalk an inch and a quarter long, very slightly sunk; basin shallow; flesh buttery, melting, and juicy, and rather rich, with a moderate, often astringent and poor flavor. Early and mid-

autumn. A strong grower, great bearer, tree spreading, irregular; leaves sharp serrate.

BEURRE D'ANJOU. Rather large, obtuse Doyenné-form, regular; surface greenish yellow, a dull red cheek to the sun, clouded with russet; stalk quite short, or half an inch long, slightly sunk; cavity uneven, basin shallow, round, smooth; flesh yellowish white, fine grained, buttery, melting, with a high, rich, vinous, excellent flavor. Shoots light green, leaves recurved, wavy

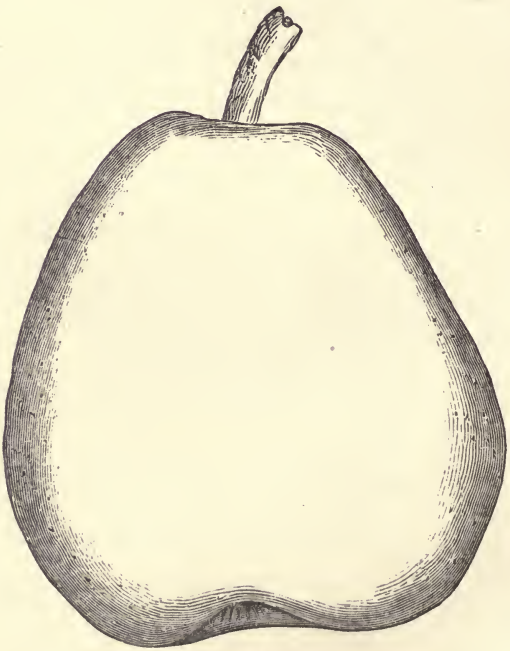

Fig. 321.—*Beurré d'Anjou.*

Begins to ripen in the middle of autumn, and keeps long, sometimes into mid-winter. The hardiness, uniformity, reliability, excellence, and long keeping qualities of the Anjou, render it one of the most valuable of all pears. French.

Beurré Hardy. Large, long obovate, sometimes obscurely pyriform; skin greenish, with thin brown russet; stalk an inch long, cavity small, uneven, oblique; basin shallow; buttery, somewhat

melting, rich, slightly sub-acid, good. Oct. Tree a strong grower, succeeds well on quince.

Beurré Navez. Rather large, roundish obovate, obscurely pyriform; yellow, with some russet; stalk large, often fleshy, cavity slight; basin moderate; flesh buttery and melting, rich, sub-acid, aromatic, perfumed, very good. Oct., Nov.

Beurré Preble. Large, oblong, obovate; greenish yellow, somewhat russeted; stalk an inch long, stout, a little sunk; flesh buttery, melting, with a rich, high flavor. Oct., Nov. Maine.

Beurré Superfin. Medium, roundish obovate, with a small, narrow neck, tapering into the stalk; greenish yellow, somewhat russeted, and sometimes a brownish cheek; very juicy and melting, with a rich, agreeable, vinous and sub-acid flavor. Oct. Tree vigorous. Grows well on quince.

Beymont. (Beurré Bieumont.) Size medium, obovate (Bloodgood-shaped); crimson russet; stalk long, curved, calyx small, basin shallow; melting, very sweet, rich, perfumed. Oct. to Dec.

Bon Chretien Fondante, or "*Melting Bonchretien.*" Size medium, roundish, slightly oblong, rarely short obovate, obtuse; surface dull green, partly russeted, numerously dotted; stalk an inch long, moderately or slightly sunk; basin small; flesh yellowish white, core yellow and rather gritty, melting, very juicy, rich, pleasant, somewhat variable. Ripens about mid-autumn or later. Hardy, vigorous. Leaves conspicuously folded and recurved.

Boussock.* (Doyenné Boussock, Doyenné Boussouck Nouvelle.) Large, thick obovate, sometimes slightly pyriform, slightly uneven; surface bright lemon yellow when ripe, partly russeted, sometimes a slight reddish cheek; stalk stout, about an inch long, varying sometimes fleshy, often oblique; basin very shallow, even; flesh buttery, melting, very juicy, with a very good flavor. Ripens middle of Sept. Shoots diverging, purplish. A valuable and reliable pear; requires early picking. Fig. 292.

Brown Beurré. (Beurré Gris, Grey Beurré, Beurré Rouge, Red Beurré, Beurré Isambert.) Large, often only medium, oblong-obovate, with a rounded taper to the stalk; skin yellowish green, russeted; stalk an inch to an inch and a half long, rather oblique, thickening into the fruit; basin rather shallow; flesh greenish white, very juicy, melting, buttery, with a rich acid or vinous flavor. Early mid-autumn. Variable in quality.

Buffum. Size medium, obovate; skin yellow, with a broad, reddish brown cheek, somewhat russeted; stalk three-fourths of an inch long, stout; cavity and basin moderate or small; flesh buttery, sweet, very good, slightly variable. Shoots strong, reddish brown, very erect; tree very productive. Valuable for its

* Pronounced Boo'sok.

fair fruit, and fine bearing qualities. Ripens end of September, but should be picked two weeks before, or it becomes mealy. Origin, Rhode Island.

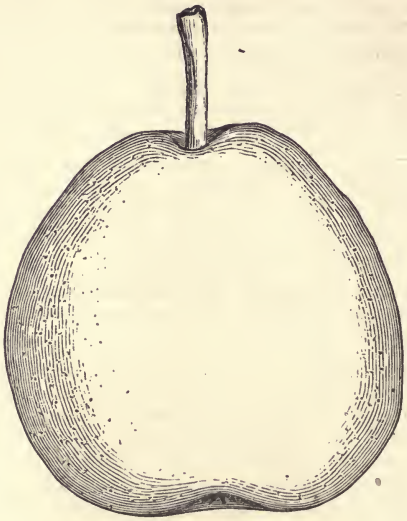

Fig. 322.—*Buffum.*

Cabot. Size medium, round-obovate, slightly irregular, crown full, obtuse; stalk an inch long, set on the pointed base without depression; surface rough, russeted, bronze yellow; basin round, smooth; flesh greenish white, breaking, somewhat melting, juicy, sub-acid, good. Early mid-autumn. Tree vigorous, very productive. Hardy, reliable. Origin, Salem, Mass.

Capsheaf. Rather small, short obovate, wide at crown, somewhat conic, or with a rounded taper to the stalk; surface deep yellow, mostly russeted; stalk an inch long, stout, slightly sunk; calyx small, basin rather large; flesh melting, juicy, buttery, mild, sweet, good, of second quality. Ripens mid-autumn. Shoots erect, stout, yellowish brown; very productive. Rhode Island.

Collins. Size medium, obovate, approaching turbinate; greenish yellow; stalk short, thick, oblique, not sunk; calyx small, scarcely sunk; flesh juicy and melting; of medium quality. First of Oct. Mass.

Compte de Lamy. Rather small, roundish obovate (Bloodgood-shaped); yellow, with dots and thin russet; stalk an inch long,

set under a lip, scarcely sunk; basin shallow; juicy, melting, refreshing, agreeable. Oct. Shoots reddish, erect.

Cushing. Medium or rather large, obovate, or Doyenné form; surface light greenish yellow, rarely a dull red cheek; stalk an inch long, cavity abrupt; basin rather shallow; flesh fine grained, buttery, melting, with a fine flavor, nearly first-rate. Ripens in the early part of autumn. Shoots spreading. Very productive. Origin, Hingham, Mass. Fig. 293.

Dallas. Size medium, obovate, slightly conic-pyriform; dull yellow, often much russeted; stalk an inch long, not sunk; basin round, slightly wrinkled; segments of the calyx rounded, stiff; flesh fine grained, melting, juicy, good. Ripens late autumn. Conn.

Delices d'Hardenpont of Angers. Medium, obovate turbinate, sometimes conic, approaching pyriform; greenish yellow, with some russet; stalk short, thick, fleshy at insertion; cavity little or none; calyx and basin small; flesh slightly coarse, juicy, rich, perfumed. Oct., Nov.

Doyenné Defais. Size medium. obovate, or short Doyenné form, sometimes obscurely pyriform; waxen yellow, with a bright red cheek; stalk curved, cavity broad and deep; calyx large, basin broad and deep; buttery and melting, sweet, rich, perfumed. Oct., Nov. Fig. 294.

Doyenné Dillen. Large, oblong-pyramidal, pyriform; fine yellow, russeted, dotted; stalk short, thick, fleshy; calyx rarely open, basin moderate; flesh juicy, buttery, sweet, and rich. Nov., keeping into Dec.

Doyenné Downing. Medium, roundish ovate; green, becoming yellow, thickly dotted; stalk short, obliquely set; basin small; flesh a little coarse, juicy, melting, rich, vinous. Sept.

Duchesse Helène d'Orleans. Large, obovate, somewhat pyriform, oblique; green, becoming yellow, slightly russeted, rough; stalk short, under a lip; basin narrow; buttery, melting, rich, vinous, slightly astringent. Oct., Nov. Belgian. New.

Dumortier. Medium, roundish obovate; dull yellow, somewhat russeted; stalk long, slender, not sunk; calyx and basin small; flesh greenish white, juicy, melting, rich, aromatic, perfumed. Sept.—quickly decays. Belgian.

Dundas. Size medium, short turbinate, sometimes obovate, base flattened; skin yellow, with a brilliant blush; stalk an inch long, stout, not sunk; calyx small, basin wide, deep, and even; flesh half buttery, tender, melting, rich, perfumed. Mid-autumn. A handsome Belgian variety. Fig. 303.

Dunmore. Large, oblong-obovate; surface greenish, with dots of brownish red russet; stalk an inch and a half long, stout, fleshy at

insertion, scarcely sunk in the obtuse and rounded base; calyx small, deep set; flesh buttery, melting, rich, often acid, sometimes astringent. Early autumn. English.

Edmonds. Medium to large, obovate; surface irregular; stalk long, stout and fleshy towards the base, set in a moderate, knobby cavity; basin ribbed or uneven; flesh yellowish white, very fine grained, melting, with a sweet, peculiar, excellent flavor. Sept. Shoots very stout, greenish brown; leaves thick, folded, recurved. Rochester, N. Y. Introduced by Ellwanger & Barry. New.

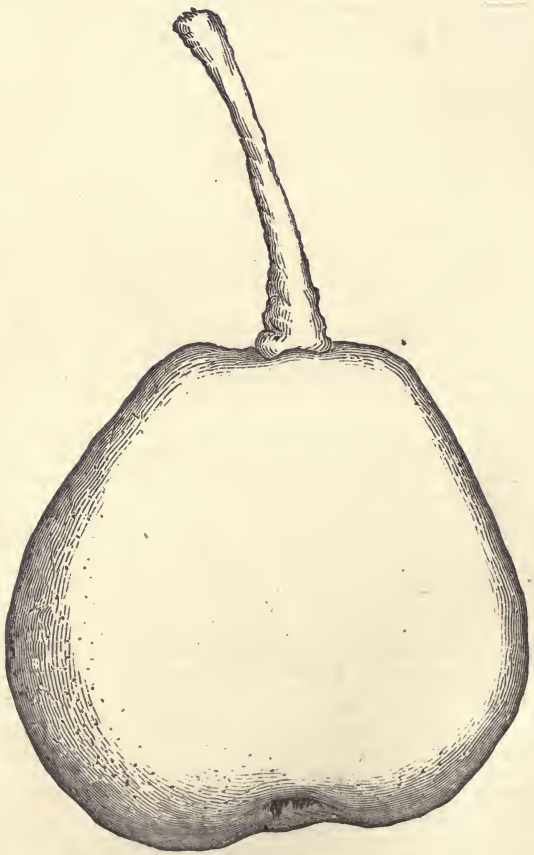

Fig. 323.—*Edmonds.*

Figue de Naples. (Fig Pear of Naples.) Medium, or rather large, oblong-obovate, sometimes slightly obovate-pyriform, base very obtuse; surface yellowish brown, with a faint reddish cheek; stalk an inch long, fleshy at insertion; basin broad, shallow, smooth; flesh buttery, not rich, becoming dry unless kept from the air. Ripens late autumn. Hardy and productive.

Flemish Beauty. (Belle de Flandres.) Large obovate, often obscurely tapering to the crown, very obtuse; surface slightly rough, with some reddish brown russet on pale yellow ground; stalk an inch and a quarter long, rather slender, cavity round, deep, narrow, often acuminate, rim obtusely rounded; basin small, round; flesh juicy, melting, often with a very rich, sweet, and excellent flavor, but variable, and sometimes not high flavored; needs house ripeniug. Shoots dark brown, diverging and ascending; growth vigorous. Its value has become much lessened of late years by the cracking of the fruit.

Fondante de Malines. Medium, roundish obovate; greenish, netted with russet, becoming rich yellow when ripe; stalk stout, long, curved, scarcely sunk; calyx small, closed; flesh buttery, melting, sweet, perfumed. Late autumn.

Golden Beurré of Bilboa. (Bilboa, Hooper's Bilboa.) Rather large, obovate, slightly pyriform, rather obtuse, very regular; surface smooth, fair, fine yellow, russeted round the stalk; dots small, distinct; stalk an inch and a quarter long, slightly sunk; calyx small, erect, basin shallow; flesh fine grained, very buttery, melting, moderately rich—sometimes an obscure acid astringency. Ripens the first of autumn, and immediately follows the Bartlett. Shoots yellow, ascending. A native of Bilboa, Spain.

Grey Doyenné. (Doyenné Gris, Grey Butter Pear, Red Doyenné, Doyenné Rouge, St. Michael Doré.) Size medium, obovate, often approaching turbinate; whole surface a handsome smooth cinnamon russet; stalk half to three-quarters of an inch long, cavity quite narrow, calyx small, closed; flesh with a very fine texture, very buttery, melting, rich, perfumed, delicious, excellent. Middle of autumn to winter. Shoots yellowish or greyish brown, ascending. Fails by cracking in many localities.

Hagerman. Medium, or small, roundish ovate; yellow, with a brownish red cheek; stalk short, stout, basin shallow; flesh juicy, melting, quality very good. Sept. Origin, L. I.

Hanners. Medium, oblong-obovate; yellowish green, becoming pale yellow; stalk stout; flesh juicy, melting, very good. Sept.

Heathcot. (Gore's Heathcot.) Medium size, obovate, regular (Buffum form), base obtuse; surface greenish yellow, partly overspread with thin russet; stalk an inch long, rather stout, cavity moderate or small; calyx partly closed, basin small; flesh fine grained,

buttery, with a rich, perfumed, and excellent flavor—sometimes hardly first-rate. Early mid-autumn. Shoots slender, upright, reddish brown. Very productive and profitable. Origin, Waltham, Mass. Fig. 295.

Henkel. Medium or rather large, round-obovate, remotely pyriform, with a very short neck, obtuse; surface yellow, often a clear pale yellow, sometimes partly russeted; stalk an inch and a half long, slightly sunk; basin small, even; flesh yellowish white, buttery, melting, juicy, sprightly, fine, sometimes only second-rate. Shoots long, slender, erect, yellowish brown; leaves small. Belgian.

Henry IV. (Ananas, Henri Quatre.) Rather small, round-obovate, somewhat turbinate; surface greenish yellow, often somewhat russeted, sometimes a dark reddish brown cheek; stalk an inch and a fourth long, slender, usually fleshy at insertion, not sunk; basin shallow, abrupt, calyx closed; flesh juicy, melting, rich, perfumed, mostly first-rate flavor. Needs house ripening. Early in autumn. Shoots diverging or spreading, yellowish brown. Very productive. Fig. 302.

Hericart. Medium, obovate, somewhat oblong and irregular, yellow, partly russeted; stalk slender, an inch or more long, cavity small, basin shallow; flesh fine grained, buttery, often gritty and slightly astringent, not rich, but with a peculiar aromatic flavor. End of Sept.

Howell. Rather large, wide-obovate, sometimes with a short obscure neck; light yellow, frequently with a handsome cheek, dots minute; stalk rather long and stout, a little fleshy at insertion, scarcely sunk; calyx in a small, smooth basin; flesh white, melting, buttery, moderately rich, aromatic, somewhat variable in quality. Tree a strong grower, fruit remarkably fair, mid-autumn. Shoots brown, strong, erect, and ascending. New Haven, Conn.

Hull. Medium size, obovate, rounded at base; skin yellowish green, some russeted; stalk an inch and a half long, rather slender, not sunk; basin shallow; flesh melting, juicy, slightly gritty at core, sweet, often fine, sometimes poor. Shoots yellow, diverging, somewhat irregular. Origin, Swanzey, Mass. A great bearer.

Jalousie de Fontenay Vendée, or "*Fontenay Jalousie.*" Size medium, conic-turbinate, approaching thick-pyriform; surface a pale dull yellowish green, more or less russeted, often a faint red cheek; stalk an inch long, often oblique, not sunk; calyx closed, stiff; basin small, round, flesh buttery, melting, mild, rich, fine flavored. Ripens at mid-autumn. Shoots greenish, rather erect, leaves long. French.

Johonnot. Rather small, roundish-obovate, sometimes nearly round, irregular; skin pale greenish yellow and yellowish brown, faintly russeted; stalk about an inch long, thick, oblique, fleshy at inser-

tion, not sunk; basin round, flesh rather coarse, melting, buttery, rich, of fine flavor. Early mid-autumn. Origin, Salem, Mass. The value of this fine little pear is lessened by the slow growth of the tree. Shoots reddish, short, diverging.

Jules Bivort. Rather large, obovate, or nearly Doyenné form; skin yellow, thickly dotted, and with much cinnamon russet; stalk long, inclined, cavity broad; basin small; flesh firm, buttery, juicy, very rich, excellent, perfumed. November. Belgian.

KINGSESSING. Large, broad, obovate, or Doyenné form, approaching pyriform, greenish yellow, thickly dotted; stalk medium or long, curved, cavity broad, uneven; calyx closed, basin shallow, irregular; flesh granular, buttery, melting, with a sweet, very good flavor. Sept. Shoots rather erect, greenish, leaves recurved. Penn. A tardy bearer. Fig. 286.

Kirtland. Rather small, roundish-obovate, covered with a rich russet, often reddened in the sun; stalk short, stout, often fleshy at insertion; calyx partly open, basin shallow; flesh buttery, very rich, perfumed, somewhat resembling its parent, the Seckel. Often rots at core, and does not always soften well, requires early gathering. First of Sept. Ohio.

Fig. 324.—*Laure de Glymes.*

Laure de Glymes. Medium or large, turbinate, or nearly Bloodgood-shaped, whole surface nearly covered with russet, becoming rich

orange yellow at maturity; stalk nearly an inch long, fleshy at base, not sunk; basin shallow, smooth; flesh buttery, high flavored, perfumed, very good. Middle of autumn, sometimes continuing quite late. Belgian.

Lyon. Size medium, Doyenné-shaped, skin yellow, thick, smooth, with a blush, finely dotted, russeted about the stalk; stalk scarcely sunk; calyx nearly closed; basin small; flesh coarse, a little gritty at core, vinous, very good. Resembles Buffum in tree and productiveness, but less dry and two weeks earlier. Newport, R. I. (Hov. Mag.)

Moore's. (Moore's Pound, Hosenshenck.) Large, obovate or nearly round, skin smooth, green, becoming rich yellow, with a slight blush, thinly and minutely dotted; stalk short, not sunk; basin small, wrinkled; flesh juicy, melting, rich, vinous. Ripens in Sept., and keeps well. Tree vigorous, productive.

Omer Pacha. Medium, turbinate, smaller specimens roundish-turbinate; skin green, partly russeted around the stalk; juicy, buttery, vinous. First of Sept.

Oswego Beurré. Size medium, obtuse oval-obovate, regular; surface yellowish green, with some thin russet; stalk three-fourths of an inch long, stout, deep set; calyx small, erect, or closed, basin smooth; flesh melting, juicy, with a fine, sprightly vinous flavor at first, becoming nearly sweet. Ripens from mid-autumn till winter, often cracks badly. Tree vigorous, hardy, very productive. Origin, Oswego, N. Y.

Petré. Medium size, obovate, sometimes slightly obovate-pyriform or truncate-conic, base or stalk end wide or obtuse; surface pale yellow, often slightly russeted, with a reddish brown cheek; stalk about an inch long, rather stout, cavity obtuse at bottom; basin small, smooth; flesh fine grained, sometimes slightly gritty, buttery, melting, rich, sweet, perfumed, often excellent—variable in quality from first to second rate. Ripens at mid-autumn. Growth moderate, shoots rather slender, yellowish.

Philadelphia. Large, roundish-obovate, broad, remotely approaching Diel form; skin yellow, thickly dotted, sometimes partly russeted; stalk stout, cavity abrupt; basin broad, uneven; flesh coarse, buttery, melting, with a very good flavor, slightly perfumed. Sept.

Raymond. Medium, obovate or Doyenné-shaped; skin yellow, stalk an inch long, scarcely sunk; basin shallow; flesh buttery, melting, excellent. Sept. Maine.

Seckel. Small, obovate, sometimes obscurely conic-pyriform, regular; skin brownish green, becoming rich yellowish brown, with a deep brownish-red cheek; stalk one-half to three-fourths of an inch long, cavity and basin small; flesh very fine grained, sweet,

very juicy, melting, buttery, the richest and highest flavored pear known. Although of slow growth and small size, like the Green Gage among plums, it is regarded as the standard of excellence. Its high musky perfume is not, however, agreeable to all. Early mid-autumn. Shoots stout, short, ascending, tree very hardy. Needs rich cultivation. Origin, near Philadelphia, and succeeds well throughout the Northern, Middle, and Western States, and is remarkably free from the blight.

Serrurier. (Fondante de Millot.) Medium, conic-obovate, obtuse, yellow, thickly dotted, slightly russeted; stalk rather short; cavity small, basin shallow; flesh slightly granular, juicy, melting, brisk, vinous. Sept., Oct.

Shepard. (Shepard's Seedling.) Medium or large, obovate, ribbed towards the crown, yellow, slightly russeted, thickly dotted; stalk an inch long, slightly sunk; calyx erect, basin ribbed; flesh very melting and buttery, of a fine, agreeable flavor. Early Oct. Dorchester, Mass.

St. Andre. Size medium, obovate-turbinate, crown blunted; skin greenish yellow, slightly dotted red, stalk an inch long, fleshy at insertion; basin shallow; flesh greenish white, fine grained, buttery and melting, perfumed, excellent. Sept. Bark cracks.

Sterling. Medium or rather large, roundish-obovate, sometimes obscurely pyriform, light yellow, often with a little russet, and a red cheek; stalk long and stout, inserted in a slight cavity by a fleshy ring; basin shallow, uneven; flesh rather coarse, juicy, half melting, good. First of Sept. The strong upright growth and productiveness of the tree, and the handsome appearance of the fruit, render the Sterling a market variety, although not standing very high in quality. Origin, Livingston co., N. Y.

Surpasse Virgalieu. Medium obovate, sometimes roundish-obovate; pale yellow, dots few, minute; sometimes faintly reddened to the sun; stalk medium, cavity moderate, oblique; basin small; flesh white, fine grained, buttery, melting, high flavored, excellent.

Tea. Medium, roundish-obovate, approaching pyriform; yellow, numerously dotted; stalk rather stout, cavity small, calyx half closed; basin shallow; flesh white, juicy, melting, vinous, very good. First of Sept. Milford, Conn.

Thompson's. Medium in size, obovate, slightly pyriform, yellow, slightly russeted; stalk an inch long, or less, stout; calyx stiff, scarcely cut; buttery, melting, and fine flavored. Late autumn.

Van Assche. (Van Assene.) Rather large, broad, obovate, slightly angular; crown obtuse, sides rounded; skin fair, smooth, dull yellow; stalk an inch and a quarter long, slender, curved, moderately sunk; calyx closed; flesh white, rather coarse, buttery, melting,

rich. Shoots light brownish purple, diverging, leaves considerably serrated. Belgian.

Mount Vernon. (Walker's Seedling.) Medium, obovate, irregular, dull brownish russet, with a red cheek; stalk very short, oblique, scarcely sunk; basin shallow, smooth; flesh greenish white, a little coarse, rich, vinous, aromatic. Oct., Nov. Roxbury, Mass.

WASHINGTON. Medium in size, oblong-obovate, obtuse, sometimes slightly obtuse-pyriform; surface smooth, clear yellow, handsomely marked with conspicuous red dots on the sunny side, slightly russeted round the stalk, which is an inch and a fourth long, and slightly sunk; calyx small, partly closed, basin shallow; flesh

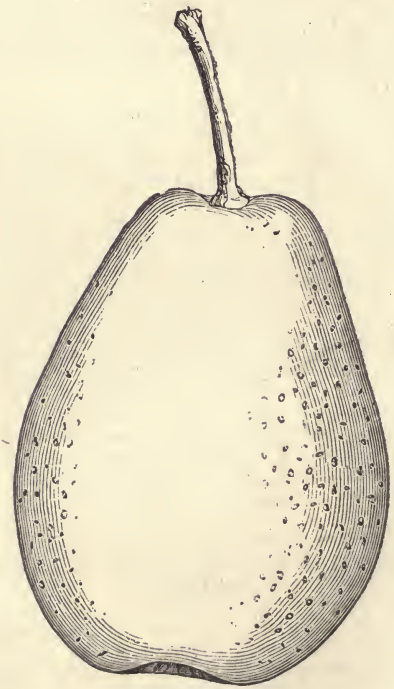

Fig. 325.—*Washington.*

very juicy, melting, slightly breaking, with a rich, unusually sweet, perfumed, excellent flavor. Early in autumn. Growth vigorous. shoots brown speckled, straight, erect, and diverging. Fruit always

fair, but varies in size and form—esteemed most by those whc like a very sweet flavor.

Westcott. Size medium, roundish-obovate; green, becoming yellow; flesh melting, juicy, good; not worthy of extension. Early in autumn. Origin, Cranston, R. I.

Wilbur. Medium in size, frequently rather small; obovate, regular, often obovate-pyriform; skin a dull green and russet; stalk three-fourths to one inch long, cavity very small; calyx prominent, scarcely sunk; flesh rather coarse, melting, juicy, pleasant, often slightly astringent, varying. Early autumn. Shoots slender, yellowish brown. Origin, Somerset, Mass.

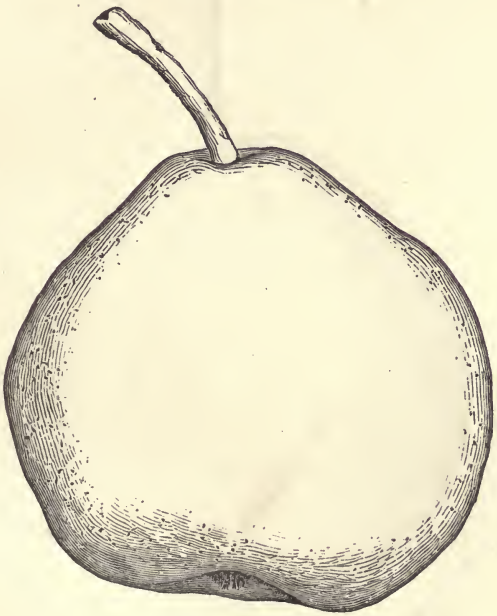

Fig. 326.—*Church.*

Wilkinson. Size medium, obovate, narrowed somewhat towards the crown, largest in the middle; skin smooth, bright yellow; stalk an inch and a quarter long, stout, scarcely sunk; calyx stiff, short, basin shallow; flesh white, juicy, melting, sweet, rich, of good flavor. Ripens from mid-autumn to winter. Shoots long, stout, upright, greenish yellow; tree thrifty, hardy, productive. A good second-rate variety. Often fails by cracking. R. I.

White Doyenné.* (Butter Pear of Penn., Virgalieu of N. Y., St. Michael of Boston, Yellow Butter, White Beurré, Doyenné, Doyenné Blanc.) Medium or rather large, regular obovate, obtuse, sometimes remotely pyriform; surface pale yellow, often a faint blush; stalk about an inch long, scarcely sunk; calyx small, basin shallow; flesh of very fine texture, white, buttery, melting, rich, and excellent. Middle to late autumn. Shoots ascending, greyish yellow; leaves folded, recurved. It fails by cracking in many

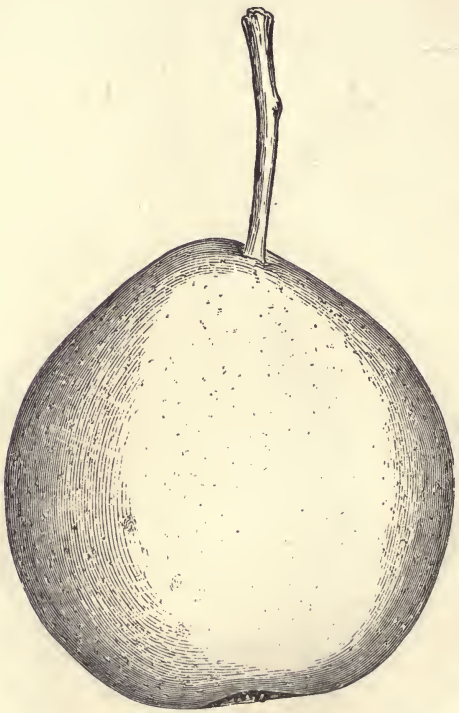

Fig. 327.—*Des Nonnes.*

localities, but in portions of the Western States it is unsurpassed in its excellent qualities of hardy growth, fair fruit, delicious flavor, and great productiveness.

North of forty-two degrees of latitude, it becomes a late autumn fruit, and may be kept into winter.

* Pronounced Doyennay'.

Class III.—Roundish or Oblate.

Beurré Goubalt. Rather small or medium, roundish-oblate, with a slight neck, greenish yellow; stalk long, cavity small, calyx large; basin shallow; juicy, not high flavored. Sept. Tree vigorous, an early and great bearer. Fig. 305.

Church. Size medium, roundish-oblate, with a very short neck, irregular; yellow, with minute dots; stalk rather long and stout, scarcely sunk; basin broad and shallow, slightly furrowed; flesh fine, very buttery, melting, with a very sweet, rich, and excellent flavor. Ripens through September. Tree vigorous and spreading, uniformly productive, and fruit unvarying in good quality. New Rochelle, N. Y.

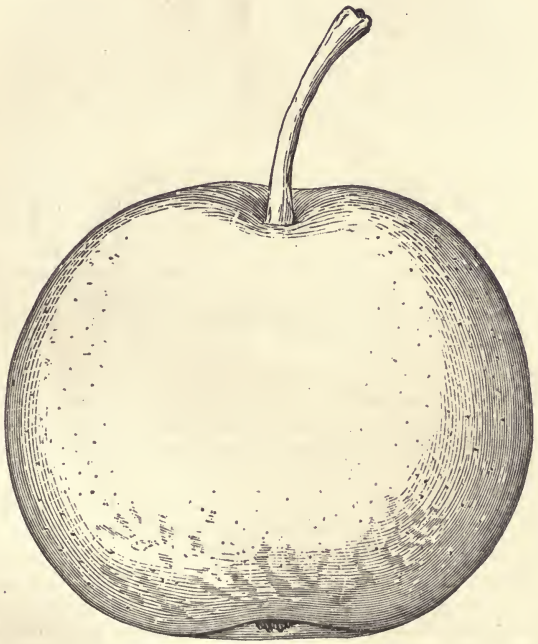

Fig. 328.—*Doyenné Robin.*

*Des Nonnes.** (Beurré de Brignais.) Size medium, roundish-turbinate, obtuse; greenish yellow becoming clear yellow with many

* Pronounced Daynonn'.

dots; stalk long, rather slender, a little curved, slightly sunk; calyx rather small, often closed in a small wrinkled basin; juicy and exceedingly melting when at perfection, very sweet, perfumed, with an excellent, delicate flavor. Variable, sometimes quite moderate. Sept.

Doyenné Robin. Size above medium, round, nearly regular, or obscurely and obtusely ribbed; skin pale yellow, usually russeted about the crown, stalk an inch and a half long, generally set in a rather deep, smooth cavity, sometimes merely planted on the surface; calyx in a smooth or scarcely furrowed basin; flesh buttery, melting, with a fine, "very good," flavor. Shoots brownish green, rather erect.

Fulton. Rather small or nearly medium; roundish, crown flattened; whole surface a smooth grey russet, becoming a dark cinnamon russet; stalk an inch and a quarter long, slender, cavity round, rather narrow; calyx long, deep cut, basin uneven; flesh half buttery, melting, rich, sprightly, agreeable, nearly or quite first-rate. Ripens middle and late autumn. Shoots rather slender, reddish brown. Tree very hardy and productive. Valuable. Origin, Topsham, Maine. Fig. 307.

Gansel's Bergamot. (Brocas Bergamot.) Rather large, sometimes only medium; roundish-oblate, more or less approaching obovate, flattened most at crown; skin yellowish brown, with a faint russet brown blush; stalk short, half or three-fourths of an inch long, ends often fleshy; cavity and basin smooth; flesh granular, melting, juicy, rich, sweet, perfumed, with a very good flavor. Ripens through several of the early weeks of autumn. Shoots short, dark grey, spreading, leaves flat, mealy. English. Fig. 306.

Huntington. Size medium, roundish, approaching obovate; yellow, rough, sometimes shaded crimson, slightly russeted, thickly dotted; stalk medium or long; cavity broad, uneven; basin moderate; flesh white, juicy, buttery, and melting, sweet, perfumed, excellent. Last half of Sept. Origin, New Rochelle, N. Y.

Merriam. Rather large, roundish, approaching oblate, rich yellow, partly russeted; stem short, cavity small, calyx closed; basin shallow, furrowed; flesh rather coarse, juicy, melting, perfumed, very good. Middle of autumn. Popular at Boston.

Roe's Bergamotte. Medium, oblate, irregular; skin yellow, reddened to the sun; stalk short, cavity narrow, abrupt; calyx small, basin narrow; flesh rather coarse, sweet, rich, perfumed. Sept. Shoots dark reddish brown, diverging, leaves small, somewhat curled. Newburgh, N. Y.

SHELDON. Medium or large, roundish, sometimes approaching broad obovate, greenish russet becoming cinnamon brown; stalk short, cavity narrow; basin smooth, rather deep; flesh a little

coarse, very melting, juicy, with a very brisk, vinous, excellent

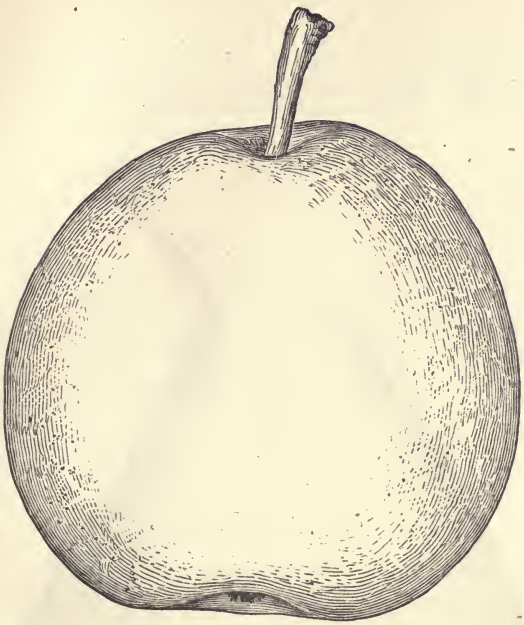

Fig 329.—*Sheldon.*

flavor. Oct. Tree vigorous, shoots ascending, yellowish brown. It requires double working on the quince.

STEVENS' GENESEE. Large, round-obovate, often considerably flattened; skin slightly rough, yellow; stalk an inch long, stout, thickest at insertion, more or less sunk in the base; calyx short, stiff, basin smooth; flesh moderately fine grained, half buttery, slightly granular, with a rich, very good flavor. Ripens the first of autumn and for some time afterwards. Rots at core when not gathered early. Shoots grey, leaves narrow. Origin, Livingston co., N. Y.

DIVISION III.—WINTER PEARS.

Class I.—Distinct Pyriform.

Beurré Clairgeau.* Large, pyramidal-pyriform, approaching long obovate, skin yellow or yellowish brown, often with a crimson shade towards the sun and brown dots; stalk short, stout, fleshy,

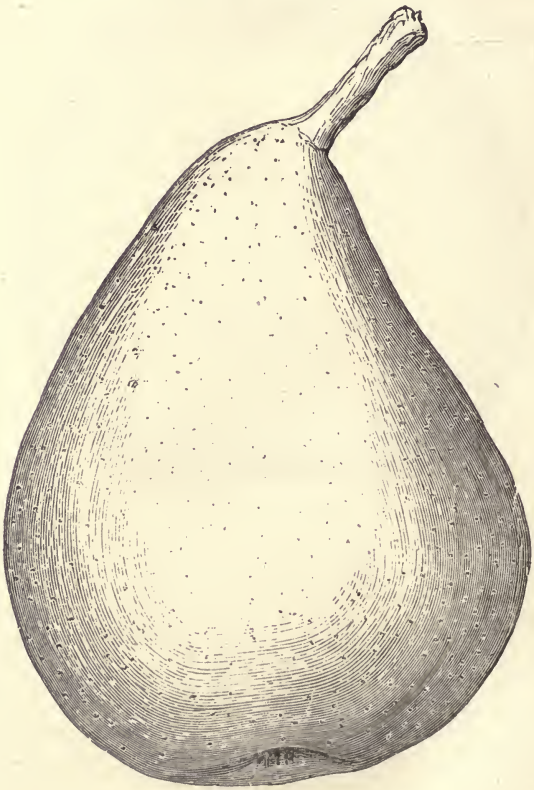

Fig. 330.—*Beurré Clairgeau.*

oblique, sunk little or none; basin shallow, furrowed; flesh white, slightly granular, buttery, melting, often with a rich, very good

* Pronounced Klair-zho'.

flavor, but frequently poor. Nov., Dec. Shoots reddish purple, short, erect, and ascending, leaves stiff.

Beurré d'Aremberg. Medium or large, short pyriform, sometimes approaching conic-obovate, neck rather small; skin thick, greenish yellow, partly russeted; stalk short or half an inch to an inch long, thick, oblique, thickening with flesh towards insertion; calyx erect; basin deep, narrow; flesh buttery, melting, rich, sub-acid, variable. Often too astringent. Nov. and Dec.

Beurré Bachelier and *Dumas*, described among autumn pears, pp. 259 and 263, often keep into winter and become winter varieties.

Beurré Langelier. Size full medium, pyriform or Urbaniste-shaped, pale yellow, slightly russeted; stalk short, cavity small; basin somewhat irregular; flesh juicy, buttery, melting, with a sweet, rich, slightly vinous flavor. Early winter. Tree a good grower on pear and quince. A light bearer on young trees. Shoots greenish, often upright, irregular, leaves broad. Fig. 288.

Black Worcester. (Iron Pear, Black Pear of Worcester.) Large, pyriform (Diel-shaped), sometimes approaching oblong-ovate; surface mostly covered with dark rough russet on a light green surface; stalk half an inch to an inch and a half long, cavity none; calyx erect, basin small; flesh hard, coarse, rich, somewhat austere; stews and bakes well. An esteemed culinary sort, bearing heavy crops, and proving profitable for market. Late autumn till mid-winter. Growth very crooked and straggling. Fig. 278.

Catillac. Large, short, conic-pyriform, approaching broad-turbinate; crown broad, flattened; yellow, often with a reddish brown cheek; stalk an inch to an inch and a half long, stout, cavity small, wavy; calyx short, erect, or spread, basin large, plaited; flesh hard, but excellent for baking and stewing, becoming tender, and of a light red color. Keeps through winter. French.

Chaumontel. (Bezi de Chaumontelle, Winter Butter.) Large, pyriform, body oblong or ovate, neck short, obtuse, often quite obscure, and the form approaching obovate or oblong—largest at the middle; skin a little rough, yellowish in the shade, with more or less brownish red, and rich deep red in the sun; stalk an inch long, moderately sunk; basin deep, uneven, or angular; flesh buttery, melting, sugary, with a fine flavor. Requires warm, rich cultivation to develop its good qualities, often poor. Shoots long, slender, dark brown. Grows well on the quince. Early winter. Old French.

Doyenné Goubalt. Rather large, roundish-pyriform, approaching roundish-obovate, pale dull yellow, russeted at stalk and calyx; stalk short, thick, calyx small, deeply sunk; melting, juicy, rich, aromatic. Dec. to Feb. Shoots greenish yellow, slightly purple, a slow grower.

Fondante de Noel. (Belle Apres Noel.) Medium or rather small, obtuse-pyriform, pale greenish yellow, with a red cheek; stalk long, stout, curved, oblique; calyx closed; basin broad, shallow, irregular. Shoots greenish yellow, growth resembles Passe Colmar; flesh whitish, melting, juicy, very good. A seedling of the Passe Colmar, ripening earlier, and of similar flavor—a fine late autumn and early winter sort. Belgian.

GLOUT MORCEAU.* (Gloux Morceaux, Beurré d'Hardenpont, Colmar d'Hiver, Hardenpont d'Hiver, Linden d'Automne.) Large, short pyriform, approaching obtuse-oval, neck very short and obtuse, body large, and tapering somewhat towards the crown; often considerably ribbed; surface green, becoming pale greenish yellow; stalk an inch and a fourth long, stout, moderately sunk; calyx large, basin distinct, rather irregular; flesh white, fine grained, buttery, melting, rich, sweet, and of fine flavor. Early winter. Succeeds best on the quince. Shoots spreading, greenish, leaves wavy or wrinkled. Variable, sometimes poor, best on trees of several years' bearing; excellent when fully grown and well ripened.

Inconnue Van Mons. Small, conic-pyriform (Madeleine-shaped), approaching obovate; skin rough, green, becoming yellowish, sprinkled with russet; stalk rather long, curved, slightly sunk; basin small; flesh granular, juicy, melting, rich. Early winter. Fig. 291.

Jaminette. (Josephine.) Medium or rather large, obovate-pyriform, approaching obovate, small specimens roundish-turbinate, varying; crown broad; skin yellowish green, with some brownish russet; dots numerous, often confluent; stalk three-fourths to an inch long, thick, cavity little or none; calyx small, erect, stiff; basin round, even; flesh juicy, melting, buttery, sweet, of good flavor. Late autumn and early winter. Shoots somewhat reddish green, erect, diverging. Origin, Metz, in France. A very strong grower on the quince.

Las Canas. Size medium, regular pyriform, somewhat conic (Tyson-shaped); neck tapering into the stalk; skin yellow, sometimes sprinkled with thin russet, rarely with russet blotches, dots small and numerous; stalk an inch long; calyx slightly sunk; flesh juicy, often good. Fig. 280.

LAWRENCE. Size medium, pyriform, approaching obovate, somewhat uneven; lemon yellow with numerous small dots; stalk an inch long, set in a small basin, ribbed; flesh whitish, buttery, with a rich, aromatic, very good flavor. Dec. Growth moderate, spreading. Shoots yellowish green. An early and good bearer, and unexcelled as a valuable early winter sort. It ripens easily, and is of uniform excellence.

* Pronounced Gloo-morso'.

Lycurgus. Small, pyriform, approaching obovate, narrowing off to the crown, dark, dull green, rough, russeted; stalk short, slender, twisted, not sunk, calyx large, slightly sunk; flesh greenish white, a little coarse, rich, very high flavored. Dec. A supposed seedling of the Seckel.

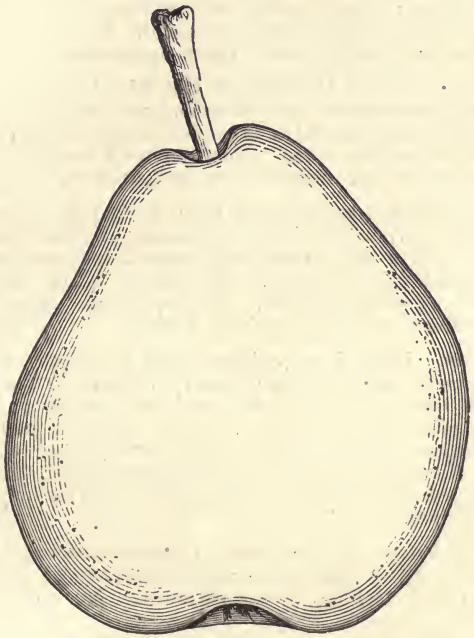

Fig. 331.—*Lawrence.*

McLaughlin. Large, pyramidal-pyriform, often roundish obovate when small, skin rough, partly russeted, greenish, becoming yellow; stalk short, oblique, not sunk; basin shallow, furrowed; flesh juicy, melting, sweet, rich, perfumed. Early winter. Maine.

Passe Colmar. (Colmar Souverain, Colmar Hardenpont, Colmar Gris.) Medium or rather large, distinct pyriform; skin yellowish green, becoming pale yellow, often lightly sprinkled with russet; stalk an inch and a quarter long, cavity obtuse or none, calyx erect, basin moderate: flesh fine grained, buttery, juicy, sweet, rich, and when well grown and ripened, of excellent, first-rate flavor—but if small and badly matured or overloaded trees, the

quality is worthless. The tree overbears, and the fruit needs thorough thinning. Leaves rather small, nearly flat. Early winter. Belgian.

Pater Noster. Large or medium, pyriform approaching pyramidal, somewhat irregular; yellow, often russeted, sometimes with a red cheek; stalk an inch long, fleshy at insertion, scarcely sunk; basin narrow; flesh buttery and melting, fine grained, rich, slightly sub-acid, often a little astringent. Early winter. Shoots short, greenish purple, erect. Often ripens wholly in autumn.

POUND. (Winter Bell, Uvedale's St. Germain, Angora.) Very large, pyriform, crown wide; skin yellowish green, with a brown cheek; stalk two inches long, calyx crumpled, basin narrow; flesh solid, hard, stems reddish color, a good culinary pear. Tree strong, healthy, productive. Shoots stout, upright, dark. Fig. 274.

Reading. Rather large, pyriform, regular, tapering somewhat to the crown, often ribbed; thickly dotted and slightly russeted, on a greenish yellow skin; stalk long, curved, enlarged at insertion, slightly sunk, basin little or none; flesh granular, rather melting, juicy, vinous, pleasant, good. Jan., and later. Shoots brownish olive, rather erect, long, slender. Penn.

St. Germain. Large, long pyriform, small specimens obovate, surface yellowish green, faintly tinged with brown to the sun; stalk an inch long, oblique, basin small and shallow; flesh white, slightly gritty, juicy, melting, sub-acid. Fails in many localities, and becomes a poor fruit. Late autumn and early winter. Shoots slender, light olive, leaves narrow, folded, and recurved. The striped St. Germain is a sub-variety, differing only in its faint yellow stripes.

Suzette de Bevay. Rather small, obovate-pyriform, inclining to conic, dull yellow, dots minute; stalk long, curved, basin shallow, uneven; flesh melting, vinous, perfumed. Jan. to March. Belgian.

VICAR OF WINKFIELD. (Le Curé, Monsieur le Curé, Clion.) Quite large, long pyriform, with a conical taper towards the crown; skin smooth, pale yellow, or pale yellowish green, with a dull reddish cheek; stalk an inch to an inch and a half long, slender, often fleshy at insertion, oblique, not sunk; basin narrow, very shallow; flesh greenish or yellowish white, juicy, buttery, with a moderate flavor—sometimes slightly astringent. Ripens late autumn and early winter, for about two months. Growth spreading and irregular, or straggling, shoots strong, dark olive. Grows well on quince stocks. The great and uniform productiveness of this pear, its fine qualities for cooking, and the long period of its continuance, render it valuable. Fig. 269.

Willermoz. Rather large, pyriform, elongated towards the crown, skin rough, green, becoming yellow, dull red to the sun; stalk one

inch long, not sunk, basin moderate, rather distinct; flesh rather coarse, granular, buttery, somewhat acid, often astringent—variable. Early winter. Shoots greenish purple, diverging, leaves dark green. Often ripens in autumn.

WINTER NELIS. (Nelis d'Hiver, Bonne de Malines.) Size rather small or medium, roundish-pyriform, often obovate, neck small and short; surface yellowish green, much russeted; stalk an inch and a quarter long, bent, cavity narrow; calyx stiff, short, basin shallow, ribbed; flesh yellowish white, fine grained, buttery, very melting, rich, sweet, or slightly vinous, perfumed, aromatic, with an excellent flavor. Early winter. Growth slender, flexuous, and straggling, leaves narrow, recurved, petioles rather long. Origin, Mechlin, in Belgium.

CLASS II.—OBSCURE PYRIFORM, OBOVATE, OR TURBINATE.

Alexandre Lambre. Size medium, roundish-obovate, yellowish green marbled with red towards the sun; stalk stout, not sunk, basin shallow; flesh juicy, melting, sweet, rich, sometimes very good, frequently poor. Nov., Dec. Shoots slender, yellowish, spreading.

BEURRÉ D' ANJOU. Commences ripening in autumn. See Autumn Pears.

BEURRÉ GRIS D'HIVER. (Beurré Gris d'Hiver Nouveau, or "Grey Winter Beurré.") Size medium, obovate, or short Doyenné-form, obtuse; skin greenish, considerably russeted; stalk thick, short, cavity moderate, basin small; flesh greenish, buttery, melting, very juicy, rich, slightly sub-acid—resembling in flavor the Beurré d'Aremberg, but rather richer and less acid. Early winter. Shoots purplish red, leaves curled. French. Promises to become valuable. Fig. 300.

Brande's St. Germain. Size medium, obovate, often considerably pyriform, narrowing to both ends, smooth and regular; skin yellowish green, thickly dotted with large russet specks; stalk an inch long, thick, obliquely set; calyx small, stiff, erect; basin small, narrow, often none; flesh buttery, melting, yellow towards the core, with a pleasant, slightly acid, good, or very good flavor. Early winter. English.

COLUMBIA. (Columbian Virgalieu, Columbia Virgouleuse.) Large, long obovate, regular, handsomely rounded or obtuse, largest near the middle; surface pale green, becoming pale yellow, always smooth and fair; stalk an inch and a quarter long, rather slender, cavity narrow, deep; calyx erect, basin small; flesh white, melting, and buttery, of moderately rich flavor. Ripens early winter. Growth upright, vigorous, shoots brownish yellow. The large,

handsome fruit, and the great productiveness of the tree, have rendered this variety popular and profitable for market, although not high in quality. It does not appear to succeed so well as far north as Boston or Rochester, as further south. A native of Westchester co., N. Y.

Coter. Size medium, obovate, obscurely pyriform, nearly regular, light yellowish green, brown in the sun, somewhat russeted; stalk an inch long, without cavity; segments of the calyx distinct and widely reflexed; basin round, moderate; flesh white, rather coarse, buttery, rich, slightly perfumed, very good. Late autumn. Belgian.

Dana's Hovey. Rather small, obovate, slightly pyriform, rich yellow, with some cinnamon russet; stalk medium, slightly sunk, basin shallow; flesh buttery and melting, of excellent quality. Dec. Shoots stout, erect. New. Mass.

Doyenné d'Alencon. (Doyenné d'Hiver Nouveau, Doyenné Gris d'Hiver Nouveau, St. Michael d'Hiver.) Medium, obovate, approaching pyriform when large, skin rough, yellow, with russet or brown dots; stalk medium, stout, moderately sunk, basin deep; flesh somewhat granular, buttery, juicy, rich, sprightly. Dec. to April. Although not of the highest flavor, this pear is one of the most valuable and reliable of good keeping winter pears.

Easter Beurré. (Doyenné d'Hiver, Bergamotte de la Pentacôte, Beurré de la Pentacôte, Beurré de Pâques, Chaumontel très gros, Canning Seigneur d'Hiver.) Large, obovate, approaching oval; surface yellowish green, with some russet; often a broad, dull reddish cheek; stalk stout, an inch long, cavity deep, sometimes obtuse, abrupt; calyx small, closed in a moderate or rather shallow, plaited basin; flesh fine grained, very buttery, melting, and juicy, and when well grown and ripened, of excellent flavor. It does not often mature well in the Northern States. Keeps through winter. Growth strong, rather upright, shoots reddish yellow; leaves narrow, folded, recurved. Grows well on the quince.

Grand Soleil. Rather small, roundish-obovate, irregular and varying, mostly covered with a rich russet; calyx small, closed; flesh yellowish white, a little coarse, buttery, melting, aromatic, very rich. Nov. and Dec. Belgian.

Jean de Witte. Size medium, flattened, obovate; stalk short, slightly sunk; basin small, calyx closed; skin yellowish green, partly russeted; flesh white, juicy, melting, sweet, rich. Dec.

Jones. (Jones' Seedling.) Size medium or small, Bloodgood-shaped, or obovate, remotely pyriform, surface rich yellow russet; stalk an inch or an inch and a fourth in length, variable in thickness, fleshy at insertion, not sunk; basin shallow; flesh yellowish, melt-

ing, of fine flavor. Ripens late autumn and early winter. Shoots diverging and ascending. Origin, Kingsessing, near Philadelphia. Productive and valuable.

Fig. 332.—*Jones' Seedling.*

Lewis. Size below medium; regular obovate, rarely obscure-pyriform; surface yellowish green, thickly dotted with dull russet; stalk an inch and a half long, slender, scarcely sunk; calyx widely reflexed, basin little or none; flesh greenish white, melting, juicy, of fine, rich flavor. Core large. Early winter. Growth vigorous, branches becoming drooping. Profusely productive. Origin, Roxbury, Mass.

PRINCE'S ST. GERMAIN. Size medium, obovate, obtuse, surface much russeted on green, dull red to the sun; stalk an inch and a fourth long, cavity small; calyx large, stiff, slightly cut, basin smooth, shallow; flesh yellowish white, juicy, melting, slightly vinous, with an agreeable and fine flavor. Keeps well, ripening through winter. Origin, Flushing, Long Island.

Vicompte de Spoelberch. (De Spoelberg, Delices Van Mons.) Medium or rather large, obovate, somewhat conic; skin slightly rough, yellow, with a purplish blotched cheek to the sun,

very slightly russeted; stalk an inch and a fourth long, stout, curved, basin round, shallow; calyx erect, short; flesh buttery, melting, rich, fine. Needs high cultivation to develop its fine qualities. Early winter. Belgian.

Zephirin Gregoire. Medium, turbinate, Bloodgood-shaped, light green becoming yellow, reddened next to the sun; stalk one inch

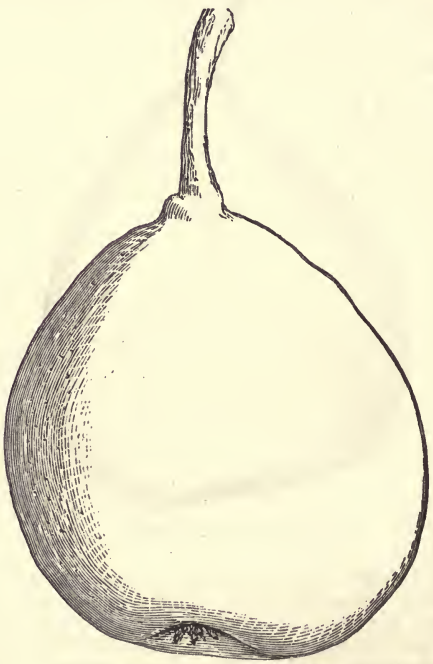

Fig. 333.—*Zephirin Gregoire.*

long, fleshy at base, basin narrow; flesh white, buttery, melting, fine grained, excellent, perfumed. Nov. to Feb.

Class III.—Roundish or Oblate.

Cross. Medium in size, roundish, surface yellow, often with a red cheek, and some russet; stalk three-fourths of an inch long, very thick, set shallow; calyx small, rather deeply sunk; flesh melting, juicy, with a rich, high, fine flavor. Early winter. Shoots rather slender, a poor grower—of little value. Mass.

JOSEPHINE DE MALINES. Size medium, conic-oblate, yellowish with small dots; stalk very long, cavity slight, basin large; flesh of a light salmon color towards the centre, buttery, of a sweet

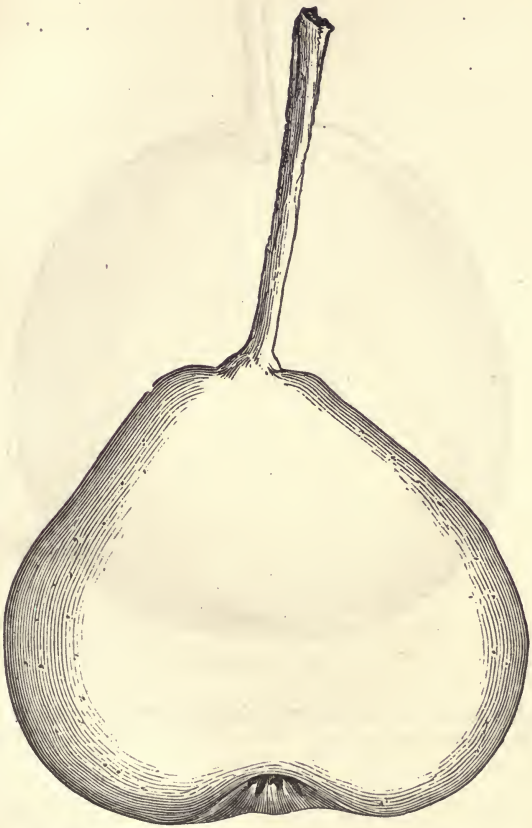

Fig. 334.—*Josephine de Malines.*

and peculiar flavor. The tree forms a handsome pyramid on quince. This is one of the best early winter pears, often keeping till mid-winter and later. Belgian.

Sieulle. (Beurré Sieulle, Doyenné Sieulle.) Medium in size, roundish-oblate, often roundish-obovate, with a very short, obscure

neck, obtuse; skin pale yellow, with a slight blush, and sometimes a brilliant broad orange cheek; stalk thick, an inch and a quarter long, cavity shallow, rarely deep, calyx slightly sunk; flesh but-

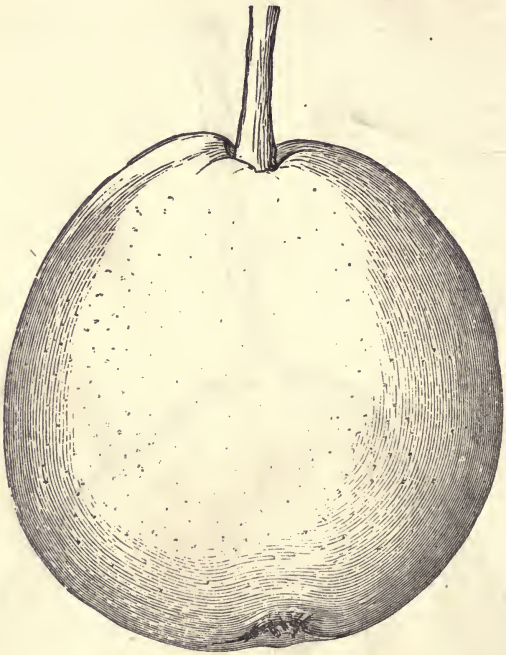

Fig. 335.—*Sieulle.*

tery, fine grained, rich, of good, often of excellent quality. Ripens late in autumn, and keeps to mid-winter. Variable, uncertain.

REGRAFTING LARGE PEAR-TREES.

Before closing this chapter on the Pear, it may be well to give some directions for changing the tops of bearing pear-trees. Some of the varieties described in the foregoing pages have already shown indications of becoming generally affected by cracking, and this disease may render a part of them worthless. In such cases it becomes desirable to regraft them with valuable sorts.

The old and common way is to cut off the trunk or a few of the

larger limbs, and insert a few grafts, say four or five in all, and compel them to form the whole new head, requiring the lapse of many years. A much better and more expeditious mode is to scatter the grafts through the top—inserting so many that each one forming a small branch of itself, the whole taken together will make a full top in a few years.

In order to render the operation plain, Fig. 336 is made to represent the unchanged tree at an age of from ten to twenty years. All the smaller branches are cut away, and those of medium size left distributed at as regular distances as may be. As the tendency of the growth is upwards, the top should be rather worked downwards in this operation, and the side limbs near the bottom allowed a full chance. In the ends of all these shoots some thirty or forty grafts are set, as shown in Fig. 337. Trees of the Virgalieu or Doyenné, which had become worthless by cracking, and which were large enough to bear

Fig. 336.

Fig. 337.

Fig. 338.

a bushel or two annually, have been entirely changed in this way to better sorts, and yielding three years afterwards larger crops than ever.

If the labor of inserting so many grafts is too great for ordinary practice, one-third or less may be set, as shown in Fig. 338.

Dwarf pear-trees of undesirable varieties may be readily changed in this way to other sorts—the more easily because they are lower,

and accessible from the ground. Old dwarf trees, which have become enfeebled by long bearing and sparse pruning, may be thus rendered thrifty and vigorous.

With trees of large size, it may be safest to change the upper half in one year, and the remainder the next, for the purpose of avoiding too great a check in growth.

Younger trees, or those but a few years old, of undesirable sorts, but of straight growth, may be used for stocks on which to work new heads of crooked or slow growers at standard height. Fig. 339 represents a tree of the Virgalieu worked over to the Winter

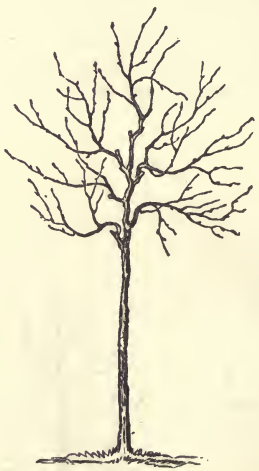

Fig. 339.

Nelis, the former being a straight and handsome tree, and the latter the most crooked grower known. A few buds of the Winter Nelis are inserted into the side limbs of the Virgalieu so as to form an even, well balanced head. The same result may be obtained by grafting these limbs in spring.

CHAPTER III.

THE QUINCE.

THE Quince, a small, irregular growing tree, about ten or twelve feet high, bears one of the best fruits for preserves and jellies, and for giving additional flavor to apple tarts. It is usually propagated by layers and cuttings. Propagation by layers is performed by bending young shoots down in spring, and burying them so as to leave a few buds at the extremity above ground, as described on page 30 of this work. When the buds on the shoots have well started, all are rubbed off or cut away but the best. They will throw out roots by autumn, and may be removed from the parent tree, and set out in rows; those which do not root the first year may be left till the second. If the ground is rich, and they are kept well cultivated and straightened by stakes, the cuttings and layers will produce trees fit for removal as standards in two or three years. This mode is more commonly used in raising the Orange quince as a fruit. In the extensive propagation of stocks for the pear, layering by *stools* is adopted. They are made by cutting back strong plants to within a few inches of the surface of the ground early in spring, or before the buds swell, which induces them to throw up a number of strong shoots, constituting the stools. These are earthed up the following spring, so that the whole of the stem and the base of all the shoots will be covered three or four inches deep. Roots will be thrown out during the same season, and these rooted shoots are separated from the plant in the autumn for transplanting in rows. The stools are well cultivated and dressed with manure the following season, and will produce another crop of shoots the second year. As each stool yields a crop in alternate seasons, there should be two sets, so that an annual supply may be obtained.

The quince is extensively propagated by cuttings, both in raising stocks and trees for fruiting. The details of the operation are described on pages 29 and 137 of this work.

The *soil* for the quince should be deep and rich, such as will raise good corn and potatoes, and should be kept well cultivated. An application of good manure should be made every year or two, and a thin sprinkling of salt over the surface in spring has often been found beneficial.

Directions for pruning young quince-trees will be found on page 95.

The total neglect of the cultivation of the quince by many who have planted out the trees, has resulted in their dwarfish and stunted growth and entire unproductiveness. To renovate such trees, cut or saw out the thick profusion of suckers which surround the stem (Fig. 340), deepen the soil with the spade as much as the roots will admit, and apply a large barrow-load of compost to each tree, made by a thorough intermixture some weeks previously, of stable manure and black muck, or other compost, and then spread a

Fig. 340.

Fig. 341.

thin coating of salt upon the surface. This should be done in the spring of the year. The pruning may be such as to remove the suckers, and reduce the number of stems to three or four, or the tree may be trimmed to one clean stem, as shown in Fig. 341. The fruit will be greatly improved by the operation.

In planting quince orchards, the distance asunder may be about ten or twelve feet, which will be found near enough for full-grown trees, on a deep, rich, and well treated soil. If the ground is previously subsoiled, and well manured by trench-ploughing, the young trees will come into bearing in about three years, and continue productive, if well managed, for forty years or more.

VARIETIES.

ORANGE or APPLE QUINCE. Large, some sub-varieties quite large, roundish, somewhat irregular, with a small and very short neck at the base; surface of a fine golden color; flesh firm, stewing

rather tender, of excellent flavor. Ripens soon after mid-autumn. Leaves oval. Tree productive if well cultivated. This is the most common sort, and by continual propagation of seedlings several sub-varieties have been produced, varying slightly in coarseness or firmness of texture, size and form. The largest sometimes weighs a pound.

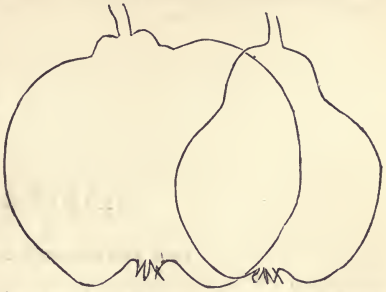

Fig. 342.—*Orange Quince.* Fig. 343.—*Pear Quince.*

Pear Quince. (Oblong or Pyriform Quince.) Size medium or rather large, pyriform, body roundish oblong, neck about one-half or one-third the length of the body; skin rather dull rich yellow; flesh firm, tough, dry, with a high flavor, stewing less tender than the Orange quince. Ripens late in autumn, and hence adapted to distant marketing. Leaves oblong ovate. A moderate bearer.

Portugal Quince. Quite large, oblong pyriform, largest at the middle and tapering to each end; yellow; flesh more juicy and less harsh than the other varieties. Stews well, and becomes a fine purple or deep crimson when cooked. Leaves broad, cordate, downy, larger than those of the common quince, and growth stronger. The fruit is rather superior in quality, but the value of the variety is much lessened by its unproductiveness. It does not strike readily from cuttings.

Rea's Seedling. (Rea's Mammoth.) Fruit resembles the Orange, but from one-third to one-half larger, and of excellent quality. Tree a very strong grower, with large dark foliage. Origin, Coxsackie, N. Y.

Angers Quince. This variety is cultivated as stock for the pear. The fruit is similar to that of the Orange, with the exception that it is later and a little harder in texture. The tree is distinguished by its vigorous growth and large leaves, and it continues growing late in the season.

Fontenay or *Paris Quince.* This is also cultivated extensively as stock for the pear. The fruit is not equal in quality to the Orange or Angers, more nearly resembling the Pear quince in form and texture. The tree has more small side shoots, grows thicker, and is less vigorous than the Angers. The Angers is further distinguished from the Fontenay by its downy shoots when young, darker wood, and short stout thorns.

The Japan and Chinese quinces are cultivated merely as ornamental shrubs.

CHAPTER IV.

THE PEACH AND NECTARINE.

THE PEACH, when in perfection the most delicious fruit of our climate, succeeds in favorable localities, from Maine to the Gulf of Mexico. In the more northern regions, the ripening of the earlier varieties commences only a few weeks before the close of the summer months; in the extreme south, well matured peaches are obtained nearly as early as cherries and strawberries at the North.

The trees are more tender and of shorter duration than most fruit trees of temperate climates. In some localities they bear only two or three good crops, and then decline or perish. On favorable soils they continue for twenty or thirty years. In Western New York trees have in rare instances borne fruit for forty or fifty years. In France, according to authentic testimony, peach-trees which have been annually and freely pruned, have lived to an age of one hundred years; and there is no doubt that on favorable soils, and by a regular shortening-in pruning, most of our orchards would endure much longer than the ordinary period.

The most extensive peach-growing regions are in New Jersey, Delaware, Maryland, and portions of the West—some orchards containing forty or fifty thousand trees, and hundreds of acres occupied with the plantations of single proprietors. The northern portions of Ohio and Western New York, protected on the north by Lakes Erie and Ontario, and Western Michigan, afford a very favorable climate for this fruit. But throughout the country at large, the selection of proper localities would doubtless afford good and regular crops, even in districts where its culture is rarely attempted. The remarks on this subject in a previous chapter of this work, are particularly commended to the attention of those who may attempt the peach culture in severe climates.

The destruction of the peach crop is caused in nearly all cases by the intense cold of winter. Vernal frosts, to which its loss is often

erroneously ascribed, rarely have any influence. If the fruit-buds remain unswollen, they will endure very severe cold. But it often happens that we have a few days of mild or warm weather during winter. This is sufficient to swell them slightly, or to throw moisture enough into them to render them tender; and if the thermometer should then sink several degrees below zero, there is scarcely a chance for their escape. Their condition may be soon ascertained by making a cross-cut with a knife through the fruit-buds. If destroyed, the centre will be dark brown; if uninjured, they will present the fresh yellow centre of sound buds. The accompanying figures represent the branches and buds of the peach magnified twice in diameter. Fig. 345 shows the two flower-buds, with the usual leaf-bud between, before they have become swollen by warm weather. Fig. 344 represents the appearance of the same after the occurrence of several warm days after mid-winter. Fig. 346 exhibits the dark and dead interior of a flower-bud cut through its centre, after it has

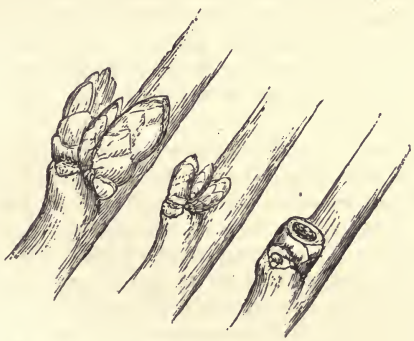

Fig. 344. Fig. 345. Fig. 346.

been killed by the frost. Under ordinary circumstances, the peach crop is destroyed when the thermometer sinks about 12° below zero (Fahr.); but when the buds have been much swollen, the crop has sometimes been cut off when only 5° or 6° below; while in rare instances, unswollen buds under favorable circumstances have passed uninjured through a temperature 20° below zero.

PROPAGATION OF THE TREES.

The peach-tree is of remarkably easy and rapid propagation. In rare instances, seedling trees have borne the second year, or sixteen

months from the planting of the stone. Stocks may be budded the first summer, affording trees five or six feet high the second autumn. Transplanted the second year from the bud, the trees, with good cultivation, usually come into bearing about the third year afterwards.

Some varieties reproduce the same from the stone with slight variation, but the only certain way to perpetuate delicious sorts is by budding. Grafting at the North rarely succeeds: at the South it is often successful. It often happens at the North, that the severe frost of winter destroys the inserted buds, which die and drop off, leaving the attached portion of bark adhering fresh and green to the stock. This disaster, which so often disappoints the hopes of the young cultivator, is to be prevented by selecting buds from the largest and thriftiest shoots. These usually possess sufficient vigor to withstand severe frosts. The triple buds on the older and more matured portions of the shoots of bearing trees generally survive when the single buds above them perish, as may be at once perceived by examining the shoots of bearing trees late in spring.

When stocks are not budded till the second summer, it is very important to cut them down the previous spring, and suffer but one ascending sprout to grow, which will form a fine thrifty shoot for the reception of the bud.

In raising stocks, select the seed of hardy and late varieties. The stones are not injured if kept dry in a cellar till winter. If they become water-soaked for a length of time, they are spoiled. But soaking in water for a day or two, and subsequent exposure to freezing, facilitate the cracking of the stone. They may be kept through winter mixed with moist sand, and exposed to freezing and thawing, or placed in a moist cellar till near spring, then soaked in tubs or barrels, till the shells are well swollen with moisture. They are then placed in thin layers on the surface of the ground, and exposed for two or three weeks to the action of the frost, being protected from drying by a covering of soil, leaf-mould, or muck. About the time the frost disappears from the ground, they are taken up and cracked by hand, placing the stone on the end of a wooden block, and striking a gentle blow on the side edge with a hammer. The kernels are thus taken out uninjured. They are then planted one or two inches deep (a light thin soil needing more depth than a heavy and moist one), and if they have been previously uninjured, nearly every one will grow. Care is needed that the seeds do not become dried nor mouldy before planting.

When it is intended for them to come up evenly, as they are to

remain in the nursery row, the most certain way to avoid vacancies or failures, is to sprout them before planting. This is effected by mixing the kernels with sand and leaf-mould, and spreading them in a thin bed in the sun. When sprouted, a line or cord, permanently marked at equal distances of eight inches with a touch of paint, is stretched on the ground, and a sprouted kernel carefully inserted at every mark of the line, by means of a transplanting trowel. This insures great regularity in the rows. Accidental vacancies may be filled from a seed bed when the plants are not more than two inches high. To prevent drying, the sprouted seeds should be kept covered with a flake of wet moss or a wet cloth, until deposited in the ground; and if the weather be dry, watering the ground may be requisite.

By planting the stones without cracking, a very small portion will grow, and no regularity can be attained in the rows, unless the following mode is adopted, which, if the stones can be had fresh from the fruit before drying many days, and in large quantities, is perhaps the cheapest or attended with least labor. Mix the fresh stones with moist sand, spread them in a stratum about six inches thick over the ground, and cover them with a few inches of old straw or coarse manure, to prevent drying. Remove this covering in winter, to expose them freely to freezing and thawing. In spring, a large portion will be found sprouting; carefully select these and plant them immediately in drills made with the hoe, covering them by drawing on earth with the hand. One man will thus plant four or five thousand in a day. In a few days a second portion will be found sprouted, which plant as before; and so on, so long as the process continues. Those which do not open (often not more than one-third of the whole), will grow another year if kept moist and exposed.

If the soil is good, and the cultivator is passed between the rows as often as once a fortnight—oftener is better—the trees will be large enough to bud by the close of summer.

In cases where the ground cannot be prepared early for their reception, germination may be retarded by burying the uncracked stones a foot or two beneath the surface, till wanted.

The distances of the rows asunder should be about the same as for apples and other trees in the nursery, or about three and a half feet.

Plum-stocks for the peach slightly lessen their luxuriance of growth, render the trees smaller, thus slightly increasing their hardiness for the extreme north by favoring an early maturity of the

young wood. It is, however, important to observe, that this does not add to the hardiness of the fruit-buds. Small dwarfs are produced by budding on the Mirabelle, a diminutive variety of the plum. The plum-stock is also sometimes employed to guard against the peach-borer, a remedy often unsuccessful, as that insect frequently attacks the peach above the place of union. On the whole, the practice of working the peach on the plum is not regarded by fruit culturists with much favor.

Unlike most other fruit-trees, the peach may be transplanted in the spring next after the insertion of the bud, with scarcely a check in its growth.

Soils. It may be observed as a general rule, that soils affording good farm crops, and with a well drained sub-soil, are well adapted to peach orchards. On a strong loam, the trees grow with more uniform luxuriance and live longer than on light, sandy, or gravelly soils. Even a compact clay may be made suitable for the peach by regular and thorough underdraining, and mellow cultivation. On the light sands of New Jersey and Delaware, orchards succeed and bear well for a time, but they do not endure so long as where the soil has a considerable admixture of heavier ingredients.

In transplanting for an orchard, the practice of *shortening-in* the shoots, described in the chapter on transplanting, should be invariably attended to, as it is of the greatest importance for the safe removal of peach-trees. Trees two years from the bud, where this practice is observed, will be found better for Northern latitudes than those of one year only. Twenty feet apart is the common distance for orchards ; but as better crops and better fruit is obtained where the heads are kept well shortened-in, and consequently within less compass, a distance of twelve or fifteen feet only will be found sufficient.

While the trees are small, the intermediate spaces between the rows may be cultivated with low-hoed crops ; but afterwards it will be found best to keep the ground perfectly clean and mellow by ploughing and harrowing. Where soils are very shallow, top-dressing with manure in autumn, and frequent harrowing, have been found best; the roots being thus brought near the surface, deep ploughing proves injurious. But where soils are deep and fertile, ploughing may be occasionally resorted to without injury.

The principle on which rotation in crops is founded, dictates that two crops of peach-trees, whether in the nursery or orchard, should not be grown successively on the same piece of ground ; diminished growth in all such instances being the result.

One of the best manures for the peach-tree is wood-ashes, whether fresh or leached; hence all composts with this material are eminently beneficial to peach orchards. When applied alone, half a peck of fresh and half a bushel of leached ashes to each tree, are suitable quantities, spread broadcast over the surface.

The mode of *pruning* and shortening-in the peach has been already described in a previous chapter.

Training the peach against walls and buildings, so essential to the successful culture of the peach in England, is rarely practised in this country. It would doubtless hasten the maturity of the crop; but the warm exposure would at the same time, unless the branches were purposely protected, render the crop more liable to destruction by frost. Espalier training has been found to give excellent fruit, in consequence of the thorough pruning and full exposure adopted in the management of the trees. Figs. 347, 348, and 349, exhibit the fan training usually adopted in espalier and wall training, in its suc-

Fig. 347.

Fig. 348.

Fig. 349.

cessive stages. The limits of this work do not admit full directions, but the following general rules may be observed as a guide, and will apply to all other annual pruning of the peach: 1. The fruit being borne on the shoots of the preceding year, a good supply of annual bearing shoots must be kept on all parts of the tree. 2. As the shoots, left unpruned, extend yearly in length, and become bare on the sides, it is necessary to cut them back, in order to keep up a supply of new shoots from their base. 3. Rub off or cut out all the shoots which spring up from the bases of shoots thus cut back, leaving only a few strong ones at regular distances, so as to admit sun and air to the leaves, which distances may be usually about six inches.*

* For full directions in pruning the peach (as well as other fruit-trees), see Barry's Fruit Garden, the best and most complete work on this subject which has appeared in this country.

RAISING PEACHES IN POTS.

Peaches are raised in pots to secure uniform crops every year in an uncertain climate, to test new sorts, to produce early bearing, and to obtain a supply of peaches where the grounds are too small for planting an orchard. Two modes are adopted—one without fire-heat, the crop maturing a little earlier than in common orchards; the other, where, by the use of fire-heat, the fruit is obtained two or three months earlier than in open ground.

Among those who have most successfully adopted the first-named mode, are Ellwanger and Barry, of Rochester. P. Barry has furnished the following statement of their management, written when the trees were three years of age and in successful bearing.

"We have now fruiting, in wooden boxes, ten by ten inches, fifty-three varieties of peaches, eleven varieties of nectarines, and seven of apricots.

"*Age, Potting, and Soil.* The trees are now three years from the bud. They were taken up in the fall of 1861; heeled-in and covered during winter; potted early in spring—March, I think; soil a mixture of about three parts yellow sandy loam, and one part of old hot-bed manure.

"*Summer Care.* After potting they were kept in a cool house, partly covered with glass, until they had made shoots four or five inches long, and the danger of cold weather over. They were then plunged to the rim of the boxes in an open border until the fall. They were carefully watered when necessary during summer, and the shoots kept as much as possible in uniform vigor, by pinching.

"*Pruning.* When potted, the yearling trees were cut back to six or eight inches, and in some cases to four inches, or only two or three buds above the union of bud and stock, the object being to grow them in the form of bushes. We now find that those cut back farthest are the best trees. [Fig. 350 represents the yearling tree; Fig. 351, the same, cut back; Fig. 352, the tree set in a pot; and Fig. 353, the same, after a year's growth.]

"*Winteriug.* On the approach of very cold weather, or just before the freezing of the ground so as to prevent out-door work, they were removed to a shed, where they were plunged, as they had been during summer, up to the edges of the tubs.

"*Spring Treatment.* On the return of mild spring weather, abundance of air was admitted, and they remained there till 1st May, when they were placed under glass, the buds at this time

being about to expand. Here they were kept till the 15th of June, at which time the fruits were set, and all danger of cold to affect the foliage past.

"*Ventilation and Watering.* During the period they were under

Fig. 350. Fig. 351. Fig. 352. Fig. 353.

glass, May 1st to June 15th, the principal points of management were VENTILATION, which was ample, and WATERING—the latter being one of the most important points in the treatment of all trees and plants in pots. Careless watering will ruin any plants, no matter how skilfully or carefully other points may be managed. DAILY watering is necessary, and as soon as out of bloom a free use of the syringe night and morning.

"*Summer Treatment.* On the 15th June, when all danger of cold was over, and the fruits set, they were removed from the glass covering and plunged in an open but sheltered border, and mulched with old hot-bed manure. Since that time they have received no care but watering, except an occasional pinch, to regulate the growth of shoots.

"There has not been a single leaf curled on any one of all these trees, showing conclusively that the curl is due to unfavorable changes of weather. Each tree now is a bush about two and a half feet high, and occupies about three feet square of space.

"The first winter we had potted trees we kept them in a cellar,

but most of the buds dropped, and we changed to the cool dry shed, the boxes plunged, and this has been successful.

"The uncertainty of our climate now, as to the peach crop, compelled us to adopt this mode of testing varieties, and we are much pleased with the results thus far. As to the amount of labor required, it would not be possible to state it with any degree of precision, as it is made up of odds and ends."

RIPENING BY FIRE-HEAT.

Isaac Pullen, of Hightstown, New Jersey, has adopted the following management with much success, and obtained an abundant supply of the earlier sorts by the first day of summer.

The young trees are taken up early in spring, when one year from the bud, the smallest in the rows being selected for this purpose. They are trimmed to a whip and cut back over a foot in height, and placed in nine-inch pots. As the new shoots are thrown out, they are successively pinched in, as often as they have made a growth of two or three inches. In this way they are kept dwarfed at the same time that they are made to assume a handsome form. The pinching process is continued during the second season, none being allowed to bear until the third, when full crops are taken from them. After the first year they are removed to thirteen-inch or full sized pots. The full grown bearing trees have stems about an inch and a half in diameter and eighteen or twenty inches up to the heads (Fig. 354). This height of bare stem has been found best both in securing the fruit from being soiled by watering, and in assisting its more perfect maturity by a full exposure to air and light.

Fig. 354.

The trees are kept under glass during winter, and the thermometer in no instance allowed to go below zero, as the fruit buds are more easily winter-killed than on trees growing in open ground. Artifi-

cial heat is commenced about the first of the year, and ripe fruit of Hale's Early (the earliest sort raised) obtained in less than five months. The heat should be sufficient to keep the temperature some degrees above freezing during the night, and up to sixty or seventy in the daytime. As warm weather advances but little fire-heat is required, and after the first of May usually none at all—the heat of the sun being sufficient to maintain the necessary warmth. When the thermometer is eighty out-of-doors, it will be ninety or upwards in the peach-house when the ventilators are kept open. The danger feared from a high temperature is of the dropping of the fruit, which is only prevented by regular and copious watering. Each tree, when in full leaf and during the growth of the fruit, requires about one gallon of water each twenty-four hours. When the fruit is within about five days of full maturity, the trees are placed out-of-doors on the south side of the house, where the exposure and open air complete the process, and give a fine flavor to the fruit, preventing that insipidity existing in peaches ripened wholly under glass. If they are placed out much sooner than this period, the exposure causes the curl of the leaf, and the fruit neither attains full size nor good quality—indeed, it is often quite worthless. About two dozen from each tree is a sufficient number, where full size and the best flavor are desired, although more than double this number are often obtained. The trees continue in bearing a few years and are then replaced by young ones.

WINTER PROTECTION FOR THE TREES.

In the chapter on the Situation of Orchards, directions were given for the selection of sites for peach-orchards, to secure them against the destruction of the crop by the cold of winter. There are large districts throughout the more northern States where a selection of this kind cannot be made, and where the frequent and general failure of the crop indicates the necessity of some artificial protection. Various experiments for this purpose have been made, among which the following have so far proved most successful.

1. Training the young trees very low or near the ground, so that the branches may be bent down in winter, and covered with straw, corn-stalks, or, still better, with forest leaves or evergreen boughs. It is important that the branches should be laid upon the earth, that they may receive warmth from below, and the covering should be thick enough to exclude the cold air. Attempts to protect the fruit buds by encasing them in non-conducting substances, without

bending down, have generally proved failures. Covering with earth has been tried, but the moisture often rots the buds.

2. As the limbs of the Peach soon become quite rigid, while the roots are more flexible, a more successful mode has been adopted: When the young trees are set out, the principal roots are extended in opposite directions and the others are kept cut off. This enables the trees, when the earth is partially dug away, to turn as on an axle by a slight twisting of the roots, so that it may be easily laid upon the ground. If trained flat or fan-shaped, it is easily covered.

3. A third mode has been successfully adopted in some of the Western States. The trees are planted in a row and the branches trained horizontally in opposite directions. Posts are set between the trees four or five feet high, and the tops connected by strong horizontal poles. On the approach of winter, rafters are placed on each side against these poles, so as to form a rather steep roof. The outer limbs may be bent under the rafters, if necessary. The whole is then covered with rough or cheap boards, and with two or three inches of earth. At the approach of warm weather in spring, the covering is partly removed to admit air and prevent the rotting of the buds, and the whole is taken off as soon as there is no danger from frost. The use of corn fodder laid on the rafters about two feet thick would be easier, and would probably answer an excellent purpose.

The earliest and hardiest sorts should be selected for these experiments, among which may be named Cooledge's Favorite, Hale's Early, Serrate Early York, Cole's Early Red, and Early Barnard.

VARIETIES.

While the Pear and Apple are chiefly affected by the influence of soil, the variations in the quality of the Peach result mostly from the effects of climate. Fine American varieties are pronounced worthless in England. In this country, some, often delicious, are of little value in unfavorable seasons. Some which succeed finely as far south as Philadelphia, lose much by removal to Western New York, from the slightly diminished warmth of the summers.

A large number of seedlings of high quality have been produced in this country, but as they vary but slightly and do not excel other named and known sorts, it becomes desirable not to extend the present list, unless by those decidedly superior to existing first-rate varieties. The similarity in quality, and the comparative shortness of the fruit season, render a small selection sufficient for ordinary

collections. Hence, the main object of the following descriptive list is to define the characters of described or well known sorts, and point out those most worthy of cultivation in our climate.

SYNOPSIS OF ARRANGEMENT.

The fruit of different varieties of the peach is marked with but few distinctive characters. A similarity in outline, texture, color, and flavor, more nearly than exists in the apple, pear, and some other kinds, renders it necessary to resort to other points of distinction. The peach presents facilities for this purpose not found in other fruits.

1. The *Divisions* are founded on the adherence or separation of the flesh from the stone, distinguishing clingstones and freestones; or more properly, on the firm or melting texture of the flesh, indicated by the terms *pavies* and *melters*.

2. The Divisions are sub-divided into *Classes*, embracing *pale* or *light-colored* flesh, and *deep-yellow* flesh.

3. The *Sections* are founded on the *glands of the leaves*. Section I. comprehends those whose leaves are deeply and sharply serrate (or cut like saw-teeth), and having no glands (or gum-like minute knobs) at the base (Fig. 355). Section II. contains those whose leaves are crenate or serrulate (with shallower and more rounded teeth), and having *globose glands* (Fig. 356). Section III. includes all those whose leaves are crenate or serrulate, having reniform or kidney-shaped glands (Fig. 357). "The form of the glands," observes Lindley, "as well as their position, is perfectly distinct; they are fully developed in the month of May, and they continue to the last permanent in their character, and are not affected by cultivation. The globose glands are situated, one, two, or more, on the foot-stalks, and one, two, or more, on the *tips* or *points* of the serra-

Fig. 355. Fig. 356. Fig. 357.

tures of the leaves. The reniform glands grow also on the footstalks of the leaves, but those on the leaves are placed *within the serratures*, connecting, as it were, the upper and lower teeth of the serratures together; their leaves, when taken from a branch of a vigorous growth, have more glands than the leaves of the globose varieties. It will, however, sometimes happen that glands are not discernible on some of the leaves, especially on those produced on weak branches; in this case, other branches must be sought for which do produce them."

Fig. 358.

Fig. 359.

4. The sections thus formed are each divided into two *sub-sections*; the first embracing those which have *large flowers*, as in Fig. 358; and the second including such as bear *small flowers*, Fig. 359. The sub-sections are in most cases distinctly marked; but a few doubtful intermediate flowers may be immediately referred to one or the other by the color of the petals, the smaller being reddish or pink, and the larger nearly white, or with light margins.

DIVISION I.—FREESTONES OR MELTERS.

Class I.—Flesh pale or light colored.

Section I. Leaves serrated, without glands.

Belle de Vitry. (Admirable Tardive.) Size medium, approaching oblate; apex depressed, suture deep; skin nearly white, tinged and marbled with bright and dull red; flesh rather firm, red at the stone, juicy and rich. Flowers small. Quite late, or last of September. This is quite distinct from the Late Admirable, which ripens two weeks earlier; and from the Early Admirable, often known by the name of Belle de Vitry, and which ripens six weeks earlier. Both of the latter have crenate leaves with globose glands.

Double Mountain. (Double Montagne.) Medium in size, roundish, narrow at apex; surface pale greenish white, with a slight soft red cheek, marbled darker; flesh white to the stone, delicate; stone ovate and rugged. Flowers small. Ripens at the end of summer. French.

Early Anne. (Green Nutmeg.) Rather small, round; surface greenish white, becoming nearly white, sometimes faintly tinged with red to the sun; flesh white to the stone, sweet, pleasant, with a faint mingling of a vinous flavor. Stone light colored, small, uncommonly smooth. Shoots with a light green cast. Very early. The tree at the north is very tender, and the young shoots are often winter-killed, which, with its slow growth and deficient productiveness, render it unprofitable for general cultivation. Flowers large, white. English, old.

The Sweetwater (serrate-leaved) is a seedling of the Early Anne but twice its size, resembling it in general character; ripening a week later, and being too tender at the North, and a miserable bearer, it is of little value.

The Sweetwater of Downing has globose glands, and is a distinct fruit—which see.

Early Chelmsford. (Mammoth.) Large, roundish, suture clear round, deep on one side; white, with a bright red cheek; flesh white, juicy, melting, slightly vinous, excellent. End of August. Succeeds well North and South.

EARLY TILLOTSON. Size medium; round, or nearly globular; thickly dotted with red on a nearly white ground in the shade, dark deep red in the sun; flesh whitish, red at the stone, to which the flesh partially adheres, juicy, rich, high flavored, more of a nutmeg and less of a vinous flavor than the Serrate Early York, and ripening about the same time or a few days earlier, or the early part and middle of August. Flowers small. Its time of maturity is often somewhat variable, even on the same tree. The young trees are of slow growth, and the leaves liable to mildew, from both of which it gradually recovers as the tree advances in size. Origin, Cayuga co., N. Y. Succeeds well and is very valuable at the South, where it ripens in June.

Emperor of Russia. (Cut-leaved, Serrated, Unique.) Fruit large, approaching oblate, one half more swollen; surface rather downy, dull yellowish white, with a dark red cheek; flesh yellowish white, rather firm, rich, high flavored. Flowers small. End of summer. Although the flavor is first-rate, it is a poor grower and a poor bearer. Origin, New York.

Fulkerson. Medium, obtuse, roundish; suture extending half round, sides unequal, skin whitish, with a rich red cheek; flesh whitish, red at stone, juicy, rich, sweet. Last half of August. Ohio.

Gorgas. Rather large, roundish, apex pointed, skin yellowish white, clouded with red to the sun, suture indistinct, cavity large; flesh whitish, stained at stone, juicy, rich, of excellent quality. Late in September. Philadelphia, Penn.

Magdalen of Courson. (Madeleine de Courson, Red Magdalen, True Red Magdalen, French Magdalen, Madeleine Rouge.) Medium size, or rather small, round, slightly oblate, suture deep on one side; surface nearly white, with a lively red cheek; flesh white, slightly red at the stone, juicy, rich, vinous. Rather early, or last two weeks of August. French, old. The genuine sort is little known in this country. Flowers large.

Malta. (Italian.) Rather large, roundish, slightly flattened, suture broad, shallow, surface pale dull green, blotched and spotted with dull purple next the sun; flesh greenish, slightly red at the stone, very juicy, melting, rich, with an excellent sub-acid, vinous flavor. Ripens end of summer. A moderate bearer. Shoots slightly liable to mildew. A spurious sort with globose glands, and of inferior quality. Has been generally disseminated in this country. Flowers large.

Noblesse. (Vanguard, Mellish's Favorite.) Large, round-oblong or oval, slightly narrower at apex, and terminated by a short acute point; skin pale green, clouded and shaded with light dull red to the sun; flesh pale greenish white to stone, very juicy, with a very rich high flavor. Tree of rather slow growth and liable to mildew, the only drawback on the value of this excellent peach. Ripens end of summer and the beginning of autumn. English. Flowers large.

Red Rareripe. (Early Red Rareripe, Large Red.) Rather large, globular, broad, and depressed, suture broad and deep, passing nearly round the fruit; skin nearly white, with red dots in the shade, and a rich dark red cheek in the sun; flesh whitish red at the stone, juicy, rich, and high flavored. Ripens during the last two weeks of summer. Flowers small. Resembles the Royal George, but superior in quality. Both are subject to mildew of the leaves.

Royal Charlotte. Rather large, approaching ovate, base slightly wider than apex, suture moderate; skin pale greenish white, with a deep red marbled cheek; flesh white, pale red at the stone, juicy, rich, fine. Flowers small. First of autumn.

Royal George. (Early Royal George.) Rather large, globular, broad and depressed, or inclining to oblate; suture deep at apex, passing two-thirds round the fruit; skin nearly white, thickly dotted with red, with a broad, deep, rich red, slightly marbled cheek; flesh whitish, very red at the stone, juicy, and rich. Ripens a week or two before the end of summer. Flowers small. A moderate bearer. Shoots liable to mildew.

Serrate Early York. (True Early York, Early York of Downing, Early Purple *erroneously*.) Size medium, roundish-oval, suture slight; dotted with red on greenish white in the shade, dark red to the sun; flesh very tender and full of juice, rich, with

a faint mingling of acid. Quite early, or middle of August. Growth rather free for a serrate-leaved peach. Very productive, and from its earliness of great value. Differs from the Large Early York by its large flowers, cut-leaves, oval fruit, and earlier maturity. Flowers large.

Walburton Admirable. Large, roundish, greenish white, dark red in sun; flesh white, red at stone, juicy, sweet. Middle and last of September. English.

Section II. Leaves crenate, with globose glands.

Astor. Large, slightly oblate, apex slightly depressed, suture distinct; surface nearly white, with a deep red cheek, stone small; flesh very juicy, sweet, good. Flowers large. Ripens end of summer. Origin, New York.

Barrington. Large, roundish-ovate, apex rather pointed, suture on one side, moderate; skin nearly white, with a deep red, marbled cheek; flesh slightly red at the stone, juicy, rich, and of high quality. Flowers large. Ripens early in autumn. Does not attain its full flavor north of New York city. English.

Bellegarde. (Galande, Smooth-leaved Royal George, Violette Hative *of some*, Red Magdalen *erroneously*.) Size medium or large, round, regular; suture shallow, deepest at apex, with a slight projecting point; skin nearly white, with a faint tinge of green, and a rich red cheek, often streaked darker; flesh slightly red at the stone, a little firm, melting, juicy, rich, and of fine flavor. Stone rather large. End of summer. French. Flowers small.

Carpenter's White. Very large, round, white, slightly greenish; flesh white to the stone, juicy, melting, rich, excellent. Middle of October, promises well for market. Vigorous and productive. New York city.

Cole's Early Red. Size medium, roundish, suture small, skin mostly mottled with red, with dark red on the sunny side; flesh juicy, rich, with a pleasant and fine flavor, hardly first-rate in quality. Flowers small. Valuable for its great productiveness and early maturity, ripening nearly as early as the Serrate Early York. American.

Cooledge's Favorite. Rather large or medium, roundish, largest on one side; suture distinct at apex; skin nearly clear white, mottled with red dots in the shade, and with a brilliant deep scarlet cheek in the sun; flesh very melting and juicy, with a rich, faintly acid flavor. Ripens about the middle of August. Flowers small. Origin, Watertown, Mass.

Druid Hill. Very large, roundish, cavity rather narrow, suture slight, with a distinct but scarcely prominent point at apex; sur

face pale greenish white, clouded with red towards the sun; flesh greenish white, purple at the stone, juicy, with a rich, very good flavor, stone long and rather compressed, much furrowed. Flowers small. Ripens quite late, or latter part of September. Origin, Baltimore.

Early Admirable. (Admirable, Belle de Vitry *erroneously*.) Size medium, nearly round, skin nearly white, with a red cheek; flesh red at the stone, juicy, rich, sweet, fine. Quite early, ripening immediately after Serrate Early York. Flowers large. French.

Favorite. Large, oblong, or oval; skin rather downy, much covered with red, very dark towards the sun; flesh red at the stone, a little firm, juicy, with a good, vinous, but not rich flavor. Flowers small. Hardy and very productive. Ripens medium or rather late, or about the second week of September. Glands of the leaves very small, obscure, or none. American.

Fay's Early Ann. A seedling from the old Early Ann, glandular, thrifty, hardy, very productive; fruit greenish white, rather small, of good and agreeable flavor. Ripens with the Tillotson, and valuable for its earliness.

Fox's Seedling. Round, slightly compressed, cavity narrow, white, with a red cheek; juicy, sweet, good. Flowers small. Season medium or rather late. New Jersey.

GEORGE THE FOURTH. Large, round, suture deep and broad, one-half slightly larger; skin nearly white in the shade, dotted red with a deep red cheek; flesh slightly red at the stone, melting, juicy, rich, excellent. Flowers small. Ripens at the end of summer. Branches rather more diverging than usual, leaves pale green, often glandless. Crops moderate, one cause of its excellence. Origin, New York.

Green Catharine. Large, round, pale green, with a red cheek; flesh bright red at the stone, tender, juicy, rather acid. Season rather late, does not ripen rich as far north as the forty-third degree of latitude. Flowers small.

GROSSE MIGNONNE. Large, roundish, slightly oblate, apex depressed, with a deep suture; skin tinged with greenish yellow, mottled with red, and with a purplish red cheek; flesh reddened at the stone, juicy, with a very rich, high, and somewhat vinous flavor; stone small, very rough. Early, the last two weeks of August. Of French origin. Flowers large. The peach usually cultivated in this country under this name, although an excellent variety, is not the genuine Grosse Mignonne, but differs in its small flowers.

HAINES' EARLY RED. Medium, round, flattened at apex, suture distinct, skin whitish, with a deep red cheek; flesh whitish, juicy,

melting, sweet, excellent. Middle to end of August. Flowers small.

HALES' EARLY. Medium, nearly round, skin mottled red, dark red cheek; flesh white, melting, juicy, and high flavored, free from the stone. Flowers large. Last of July and first of August. Tree vigorous, healthy, an abundant bearer, ripening ten days or two weeks before any other good variety.

Hastings Rareripe. Rather large, roundish, sometimes slightly flattened, skin yellowish white, shaded purplish red; juicy, excellent. Middle of September. Flowers small.

Jones' Early. Medium, roundish, suture shallow, distinct; yellowish white, with pale red; flesh slightly reddened at stone, juicy, rich, excellent. Twentieth of August. Staten Island, N. Y.

LARGE EARLY YORK. (Early York, Honest John.) Large, roundish, inclining to oblate in fully grown specimens, nearly white in the shade, with red dots, and with a deep red cheek to the sun; flesh nearly white, fine grained, very juicy, with mild, rich, excellent flavor. Flowers small.

The NEW YORK RARERIPE (a name which has been more or less applied to nearly all the early red peaches sent to New York market), or Livingston's New York Rareripe, is usually regarded as identical with the large Early York, but the late T. Hancock, of Burlington, considered them distinct, the New York Rareripe being rather superior, and ripening three days later.

Late Admirable. (La Royale, Bourdine, Têton de Venus, Judd's Melting, Motteux's, Late Purple *incorrectly*.) Quite large, roundish, inclining to oval, with a deep suture extending nearly round, and an acute swollen point at the apex; surface pale yellowish green, with a pale red cheek, marbled with darker red; flesh greenish white, red at the stone, juicy, delicate, flavor excellent. Flowers small. Season rather late. Of French origin.

LATE RED RARERIPE. Large, roundish-oval, apex marked with a depressed suture and sunken point; skin rather downy, pale greyish yellow, spotted and thickly marbled, deep dull red to the sun, and with fawn-colored specks; flesh white, deep red at the stone, juicy, with a very rich and high flavor. The fruit is distinguished by its peculiar *greyish* cast. Flowers small. Season, the first two weeks of autumn. American.

Moore's Favorite. Large, roundish, white, with a blush; flesh white, rich, vinous. Stone small, free. Early in September. Mass.

Morris' Red Rareripe. Large, roundish, apex slightly depressed, suture moderate, distinct; surface greenish white, with a bright rich red cheek; flesh greenish white, quite red at the stone, juicy,

sweet, rich. Flowers small. Season, end of summer. Origin, Philadelphia. Differs from George IV. in its darker leaves, heavier crops, more even fruit, inferior flavor, and in ripening a few days later.

Morrisania Pound. (Hoffman's Pound.) Very large, nearly round, surface dull greenish white, with a brownish red cheek; flesh pale yellowish, juicy, tolerably rich. Late. Flowers small. Origin, New York.

NIVETTE. Large, roundish, sometimes slightly oval, suture slight, apex but little depressed; surface light yellowish green, with a faint red cheek; flesh pale green, varying from pink to deep red at the stone, juicy and melting, and with a very rich flavor. Season medium, immediately preceding or ripening nearly with Morris White, and one of the best of its season for the north. Flowers small. Of French origin.

OLDMIXON FREESTONE. Large, roundish, slightly oval, one side swollen, suture visible only at apex; cavity shallow; surface a pale yellowish white, marbled with red, with a deep red cheek when fully exposed; flesh deep red at the stone, tender, rich, excellent. Season medium, or the first of autumn. Flowers small. Succeeds well in all localities, and has few equals as a variety for the North, to succeed the early peaches.

President. Large, roundish-oval, with little suture; skin very downy, yellowish white, with a tinge of green, and a dull red cheek; flesh nearly white, deep red at the stone, very juicy, and with a high flavor; stone rough, to which the flesh partially adheres. Flowers small. Ripens a little later than Morris White, or middle of September.

Scott's Early Red. Medium size, roundish, suture distinct, moderate; skin nearly white, mottled and covered with red; flesh very juicy, with a rich, fine flavor. Flowers small. Rather early, or end of summer. New Jersey.

Scott's Nectar. Large, roundish-oblate, bright red on pale yellow; flesh white, sweet, excellent. Early in September.

Stetson's Seedling. Large, roundish, suture indistinct, crimson on greenish white; flesh white, pink at the stone, juicy, rich, excellent. Last half of September. Mass.

Stump the World. Large, slightly oblong, red cheek; flesh white, with an excellent flavor, free from the stone. Flowers small. Ripens middle of September, just after Oldmixon Freestone, which it resembles in size, appearance, and flavor.

Sweetwater, Early. (Downing.) Medium, roundish, suture slight. skin whitish, rarely with a faint blush; flesh white, slightly stained at stone, juicy, sweet, melting, agreeable. Ripens with Tillotson and Serrate Early York. Flowers large.

Troth's Early. (Troth's Early Red.) Small, round, red; flesh white, red at stone, not of first quality, but esteemed as a valuable early market variety—freestone. Flowers small. Early in August.

VAN ZANDT'S SUPERB. Size medium, roundish, one-half larger, suture slight; skin nearly white, with a beautifully dotted red cheek; flesh whitish, tinted with red at the stone, juicy, sweet, of fine pleasant flavor. First of autumn. Origin, Flushing, Long Island. Flowers small.

Walter's Early. Rather large, roundish, surface nearly white, with a rich red cheek; flesh whitish, touched with red at the stone, juicy, sweet, of fine flavor. Ripens the last week of summer. Flowers small. A native of New Jersey, and is a valuable peach at the North.

WARD'S LATE FREE. Large, not quite of the largest size, roundish, surface dull yellowish white, with a red cheek, nearly the color of the Oldmixon Free, but not so clear nor bright; flesh nearly white, of excellent flavor. One of the finest late peaches of the Middle States. Flowers small.

Washington. (Washington Red Freestone.) Large, somewhat oblate, with a broad, deep suture passing nearly round; skin thin, yellowish white, with a deep crimson cheek; flesh nearly white, tender, juicy, sweet, rich. Stone small, to which the flesh slightly adheres. Rather late. Flowers small. Origin, New York.

White Imperial. Rather large, roundish, often slightly oblate, depressed at apex, suture moderate, surface pale yellowish white, often with a faint tinge of green; slightly tinged and sometimes striped with light purple to the sun; flesh very juicy, delicate, sweet, excellent. Flowers small. A uniform moderate bearer, and a valuable peach at the North, but worthless in Virginia. Ripens rather early, or latter part of August. Origin, Cayuga co., N. Y.

Section III. Leaves with reniform glands.

Baldwin's Late. Large, oblong, pointed at apex, greenish white, with a slight red cheek; flesh firm, juicy, good. End of October, keeping well. Flowers small. Southern Alabama.

Baugh. Medium, roundish, slightly pointed, suture obscure; flesh yellowish white, quite white at the stone, melting, juicy, with a sweet, pleasant flavor—free from the stone. First of October. Georgia.

BREVOORT. (Brevoort's Morris, Brevoort's Seedling Melter.) Medium or large, round, and slightly oblate, suture distinct, deep at apex; skin nearly white or with a faint dingy hue, with a bright red cheek; flesh rather firm, slightly red at stone, rich, sweet, and

high flavored. Flowers small. First of autumn. Moderately and uniformly productive. Origin, New York.

Chancellor. (Late Chancellor, Noisette.) Large oval, suture distinct; skin nearly white, with a dark crimson cheek; flesh deep red at the stone, with a rich, vinous flavor, stone oblong. Flowers small. Late. Of French origin.

Columbus June. Medium to large, flattened at apex, skin pale yellowish white, with a rich, red cheek; flesh slightly reddened at stone, melting, of excellent flavor. Flowers small. Georgia, where it ripens the twentieth of June.

Early Newington Freestone. Size medium, roundish, one-half always larger, suture distinct, surface nearly white, dotted and streaked with red, the cheek a rich red; flesh white, red at the stone, at first wholly adhering, but as it ripens, partially separating from it, juicy, rich, fine. Flowers small. A valuable early variety, ripening immediately after the Serrate Early York.

Early Purple. (Pourprée Hâtive, Pourprée Hâtive à Grands Fleurs.) Size medium, globular, depressed, a deep suture across the apex; skin light yellow, with a mottled, purplish red cheek; flesh red at the stone, melting, juicy, with a high flavor; stone broad and rough; season early, or middle or latter part of August. Flowers large. Rare in this country. The Serrate Early York has been propagated under this name in portions of this country, and the Grosse Mignonne in Europe; from both of which it differs in the glands of its leaves.

Henry Clay. Very large, deep purple in sun; flesh greyish white, delicate, tender, peculiar flavor. First of August at the South, September at the North. Miss.

Jones' Large Early. Large, roundish, flattened at ends, suture deep, skin white, shaded deep crimson; flesh white, pink at stone, juicy, rich, excellent. Middle of August. Staten Island, N. Y.

Kenrick's Heath. (Freestone Heath.) Very large, oblong, suture slight, apex pointed; surface pale greenish white, with a purplish red cheek; flesh deep red at the stone, rather coarse, very juicy, sub-acid, often poor; when well grown on some localities, it proves a good sub-acid peach. Flowers small. Season medium, or rather late. New England. Valued for drying.

Lady Parham. Large, roundish, suture distinct, yellowish white, downy; flesh pale, red at the stone, firm, with a rich, vinous flavor. October. Georgia.

La Grange. Large, oblong, surface pale greenish white, rarely tinged with red by the sun; flesh juicy, with rich, fine flavor. Flowers small. Quite late. Origin, Burlington, N. J., and does not attain a fine flavor much further north.

Montgomery's Late. Large, round, skin downy, yellowish white, with a dull red cheek; flesh whitish, red at stone, juicy, melting, very good. September. Ga.

MORRIS WHITE. (Morris' White Rareripe, White Rareripe, Lady Ann Steward.) Rather large, roundish, or roundish-oval, often obscurely obovate or a little larger towards the apex, suture small; surface rather downy, of a pale creamy white at maturity, rarely tinged with purple to the sun; flesh slightly firm, wholly white, very free from the drab stone, melting, juicy, with a good, rich flavor, hardly of the highest quality at the North, better in the Middle States; very popular everywhere. Season medium, or early in autumn.

Cole's White Melocoton, as usually cultivated, is a synonym; but when genuine, is quite distinct, according to the late T. Hancock, being larger, heavier, and rounder, and ripening two weeks later. Flowers small.

President Church. Large, roundish-oval, suture slight, pale red in shade, dark red in sun, handsome; flesh white, pale red at stone, very juicy, melting, and of delicious flavor. Middle of September. Georgia.

Scott's Magnate. Large, roundish-oblate, pale yellow, with a dark red cheek; flesh white, very good. Early in September.

Snow. Large, globular, suture distinct only at apex; skin thin, wholly white; flesh white to the stone, juicy, sweet, rich. First of autumn. Flowers small. Very variable, sometimes worthless for the table. A beautiful peach for preserving.

Strawberry. (Rose.) Size medium, oval, cavity deep, suture passing half round, surface mostly marbled with deep red; flesh whitish, melting, rich, of fine flavor. Flowers small. Early.

CLASS II.—FLESH DEEP YELLOW.

Section I. Leaves crenated, with globose glands.

Baltimore Beauty. Rather small, round-oval; skin deep orange, with a bright red cheek; flesh yellow, red at the stone, sweet, good, mealy when over ripe. Quite early. Flowers large. Origin, Baltimore, where it is good, but it proves of third-rate quality at the North.

BARNARD. (Early Barnard, Yellow Barnard.) Rather large, roundish, suture distinct, mostly covered with dark brownish red; flesh deep yellow, red at stone, juicy, rich, very good. Tree hardy and a great bearer. Flowers small. This is a seedling of the Yellow Alberge, which it much exceeds in quality.

CRAWFORD'S EARLY. (Early Crawford, Crawford's Early Melo-

coton.) Very large, oblong-oval, sometimes round-oval; apex with a prominent point, suture shallow, surface yellow, with a red cheek; flesh very juicy, rich, slightly sub-acid, of good but not the highest flavor. End of summer and beginning of autumn. Productive. Flowers small. Ranks very high in the Northern, Middle, and Western States, as a market variety. Origin, New Jersey.

CRAWFORD'S LATE. (Crawford's Late Melocoton.) Very large, roundish, suture shallow, distinct; surface yellow, with a broad, dark red cheek; flesh red at the stone, rich, juicy, vinous, hardly first-rate. Quite late, or latter part of September. Flowers small. Origin, New Jersey. The common Red Cheek Melocoton is cultivated in some localities under this name. Often a poor bearer.

Hatch. Roundish, pointed, suture shallow, red on deep yellow; sweet, excellent. First of September. Conn.

JAQUES' RARERIPE. Very large, roundish, slightly oblate, suture distinct, one side slightly larger, surface a little uneven; surface deep yellow, variously shaded with red; flesh deep yellow, red at the stone, of good but not of the highest flavor. Shoots diverging. Flowers small. Ripens at the end of summer. Origin, Mass.

Lincoln. Large, roundish, suture large, skin downy, mostly dark purplish red; flesh tinged with red at stone, juicy, excellent. Through September. Mass.

Merriam. Very large, roundish-oval, with a bright red cheek; melting, juicy, sweet, rich. First of October.

Mrs. Poinsette. Large, globular, skin yellow, brown to the sun; flesh juicy, melting, rich, excellent. South Carolina, where it ripens early in August.

Poole's Large Yellow. Large, roundish, suture half round, dark red on deep yellow; flesh yellow, red at stone, rich, juicy, very good. Last of September. Near Phila., Pa.

Red Cheek Melocoton. Large, roundish-oval, with a point at apex; surface yellow, with a deep red cheek; flesh red at the stone, juicy, with a good, rich, vinous flavor, not of first-rate quality. Ripens rather late, or during the last half of September, in the Middle States about the first of autumn. Flowers small. Extensively cultivated as a market peach.

Reeves' Favorite. Large, roundish-oval, pointed, with a fine red cheek; melting, vinous, good. Middle of September. N. J.

SCOTT'S NONPAREIL. Large, roundish, slightly oblong, surface deep yellow with a red cheek, resembling Crawford's Late, but

sweeter. Flowers small. Origin, Burlington, N. J, where it ripens about the 12th of Sept.

Tuft's Rareripe. Medium, roundish, with a bright red cheek, melting, sweet, rich. Last half of September.

Yellow Alberge. (Purple Alberge, Yellow Rareripe *erroneously.*) Size medium, roundish, suture distinct, passing half round; skin yellow, with a deep purplish red cheek; flesh deep red at the stone, juicy, sweet, pleasant, of moderate flavor.

Yellow Admirable. (Abricotée, Admirable Jaune, Orange Peach, Apricot Peach.) Large, roundish-oval, suture small, and on one side only; surface wholly yellow, or faintly reddened next the sun; flesh slightly red at the stone, firm, and rather dry; flavor sweet and agreeable, stone small; season very late. Flowers large. Of French origin. Adapted to the Middle States.

YELLOW RARERIPE. (Large Yellow Rareripe.) Large, roundish, suture a little sunken, extending more than half around, with a small point at apex; skin deep orange yellow, with a rich red cheek with faint streaks; flesh deep yellow, red at the stone, juicy, melting, with a very good vinous flavor. Stone small. End of Aug. Flowers small.

Section II. Leaves with Reniform Glands.

BERGEN'S YELLOW. Very large, round, slightly oblate; suture distinct, passing more than half round; surface deep orange, with a broad deep red cheek; flesh juicy, rich, exeellent. Ripens the first of autumn. Flowers small. This is perhaps the finest of all yellow-fleshed peaches. Origin, Long Island, N. Y.

It differs from the Yellow Rareripe in its more oblate form, darker color, superior flavor, and later maturity, and in its reniform glands. Tree of feeble growth.

Columbia. Large, roundish-oblate; suture distinct, passing half way round; skin rough, rather thick, dull dingy red, with spots of darker red; flesh yellow, rich, juicy, of excellent flavor. Origin, New Jersey. Ripens early in autumn. Shoots dark reddish purple. Flowers small.

Smith's Favorite. Large, roundish; suture deep; deep rich red on yellow; juicy, rich, very good. Last half of Sept. Valuable.

Smock Freestone. Large, oval, base rather narrow; orange red on yellow; flesh red at stone; moderately juicy and rich. First of Oct. N. J.

Susquehanna. Very large, nearly round; skin rich yellow, with a red cheek; flesh sweet, juicy, rich, vinous. First to middle of Sept. Penn.

DIVISION II.—CLINGSTONES OR PAVIES.

CLASS I.—FLESH PALE OR LIGHT COLORED.

Section I. Leaves serrated, without glands.

Old Newington. (Newington, Large Newington.) Large, roundish, suture slight; surface nearly white, with a fine red cheek, somewhat streaked with darker red; flesh nearly white, deep red at the stone; partly melting, juicy, rich. Season, rather late, or middle of Sept. Flowers large.

A sub-variety, cultivated to a considerable extent in this country, has *globose glands.*

Smith's Newington. (Early Newington.) Size medium, roundish-oval, narrower at apex, one side slightly enlarged; surface pale yellow, with a lively red cheek, streaked with purple; flesh bright red at the stone, juicy, good. Ripens end of summer. Flowers large.

This is of English origin, and is quite distinct from the Early Newington Freestone, a *melting* (not *firm-fleshed*) peach, often adhering to the stone.

Section II. Leaves crenate, with globose glands.

LARGE WHITE CLINGSTONE. Large, round, suture slight, point at apex small; skin white, dotted with red, or with a light red cheek next the sun; flesh very juicy, sweet, rich, and high-flavored. Season, early in autumn. Flowers small. Origin, New York.

OLDMIXON CLINGSTONE. Large, roundish-oval, suture distinct only at apex, fruit slightly larger on one side; surface yellowish white, dotted with red, or with a red cheek; flesh juicy, rich, with a high flavor. Flowers small. Ripens first of autumn. This is one of the finest of clingstone peaches.

Section III. Leaves with reniform glands.

Catherine Cling. Large, roundish-oval, swollen most on one side, with a small point at apex; surface pale yellowish green, thickly dotted and with a cheek of red, with darker streaks; flesh firm, dark red at the stone, juicy, rich, fine. Season late. Flowers small. Of English origin. The fruit of this variety, and of the Old Newington, and Oldmixon Cling, considerably resemble each other, but all differ in the glands of the leaves.

Chinese Cling. Large, globular, suture shallow; fine red on yellowish white; flesh white, red at the stone, rich, vinous, excellent. Middle of Sept.—middle of summer at the South. China.

Donahoo Cling. Very large, roundish, suture deep on one side;

creamy white, tinged red in the sun; flesh white to the stone, juicy, rich, excellent. Georgia, where it ripens middle of Sept.

Hyslop. Large, roundish-oval; crimson on white; juicy, rich, vinous. First of Oct.

Heath. (Heath Cling, White Heath.) Very large, oblong-oval, the largest specimens nearly round, with a large, conspicuous point at the apex; suture distinct on one side; surface quite downy, pale yellowish white, sometimes faintly tinged with red next the sun; flesh exceedingly juicy, becoming melting, with a sweet, very high, rich, and excellent flavor; leaves large, wavy, deep green, slightly crenate. Flowers small. Season very late, about mid-autumn, and the fruit may be kept nearly till winter. At the North it matures fully in the warmest seasons only; and never attains its full size, which is about three inches in diameter, unless much thinned on the branches, to effect which a thorough shortening-in is the best mode. Origin, Maryland. Tree quite hardy and vigorous. In Southern Virginia, the Heath is rather an uncertain peach, but when perfect it ripens there the first fortnight in autumn.

Pavie de Pompone. Very large, roundish-oval, suture distinct on one side; a deep red cheek on yellowish white ground; flesh deep red at stone, juicy, sweet, good. Flowers large. First of Oct. French.

Rodman's Cling. (Red Cling.) Large, oblong; red next the sun; flesh whitish, firm, juicy. Last of Sept. Flowers small. American.

Shanghae. Large, oval, flattened, suture distinct, deepened at apex; skin greenish yellow, shaded pale red; flesh greenish yellow, melting, juicy, with a high, vinous flavor. First half of Sept.

Class II.—Flesh deep yellow.

Section I. Leaves serrate, without glands.

Orange Clingstone. Large, round, suture distinct, passing nearly round, with no point at the apex; surface deep orange, with a dark red cheek; flesh rather firm, rich, juicy, vinous. Season, early in autumn. Flowers small.

Section II. Leaves with reniform glands.

Blanton Cling. Large, oval, pointed; skin rich orange, with a slightly reddened cheek; flesh orange yellow, firm, vinous, good.

Lemon Clingstone. (Kennedy's Cling, Pine-Apple Cling, Yellow Pine-Apple.) Large, oblong-oval, slightly narrowed at apex, terminated by a large prominent point; surface deep yellow, with a

dark brownish-red cheek; flesh firm, slightly red at the stone, with a rich, vinous, sub-acid flavor. Flowers small. Rather late. Tree productive, hardy. Origin, South Carolina.

TIPPECANOE. Large, nearly round, slightly compressed; surface yellow, with a red cheek; flesh yellow, juicy, vinous, good. Quite late. Flowers small. A native of Philadelphia; of little value much further north. New.

Washington Clingstone. Size medium, roundish; surface yellowish green, with grey specks, and with a slight tinge of red to the sun; not handsome; flesh very tender, sweet, high flavored. Flowers small. Quite late.

CLASS III.—FLESH PURPLISH CRIMSON.

Section I. Glands reniform.

Blood Clingstone. (Claret Clingstone, Blood Cling.) Large, often very large, roundish-oval, suture distinct; skin quite downy, dark, dull, clouded, purplish-red; flesh deep red throughout, firm, juicy, only valuable for culinary purposes. Flowers small.

The French Blood Clingstone, the parent of the preceding, only differs from it in its smaller size and large flowers.

The Blood Freestone is much smaller and of no value.

NEW PEACHES, SEE APPENDIX.

NECTARINES.

The Nectarine being nothing more than the peach with a glossy skin, the same rules for cultivation will apply equally to both, with the exception that as its smooth surface renders it eminently liable to the attacks of the curculio, special attention must be given to the destruction of this insect.

The nectarine is usually inferior, and has more of the *noyau* flavor than the peach, and the shoots are of smoother and more compact growth.

DIVISION I.—FREESTONES.

CLASS I.—FLESH PALE.

Section I. Leaves with reniform glands.

DOWNTON. Medium in size, roundish-oval, pale green, with a deep violet-red cheek; flesh pale green, slightly red at the stone, melting, rich, excellent. Ripens end of summer. Flowers small English.

Duc de Telliers. Rather large, roundish-oblong, apex slightly narrowed, base broad; pale green, with a marbled purple-red cheek; flesh pale red at the stone, juicy, sweet, good. Flowers small. Rather early, or end of summer.

EARLY VIOLET. (Violet Hative, Aromatic, New Scarlet, Large Scarlet, Early Brugnon, Violet Musk, Violette Musquée.) Size medium, roundish, apex slightly narrowed, suture shallow; skin with a dark purple red cheek and brown dots, on pale yellowish-green; flesh whitish, much reddened at the stone; stone roundish, moderately rough, reddish or reddish brown; flesh melting, rich, high-flavored, and aromatic; of the finest quality. Season medium or end of summer. Flowers small. Distinguished from Elruge by its redder flesh and stone, and darker skin.

The *Large Early Violet*, or *Violette Grosse*, differs in its larger size and rather inferior flavor.

ELRUGE. Medium in size, roundish-oval, suture slight, distinct at apex; skin a dark red or deep violet on a greenish yellow ground, with minute brownish dots; flesh greenish white, slightly, sometimes scarcely stained with pale red at the stone; juicy, rich, high flavored; stone rough, pale. Flowers small. Season about medium, or first of autumn. This is one of the best and most celebrated of nectarines.

Hardwicke Seedling. Large, roundish, approaching oval, resembling Elruge; skin with a violet-red cheek on pale green; flesh greenish white, slightly reddened at the stone, juicy, rich, high flavored. Flowers small. Season medium, or end of summer. English.

New White. Rather large, nearly round; skin white, often a slight tinge of red; flesh white, tender, juicy, rich, vinous; stone small. Flowers large. Season medium, or first of autumn. English.

The *Old White* resembles the preceding, but is less hardy and productive.

CLASS II.—FLESH DEEP YELLOW.

Section I. Leaves serrate, without glands.

Hunt's Tawny. Nearly medium size, roundish-ovate, narrowed and pointed at apex, one side slightly enlarged; skin a dark red cheek on pale orange, with numerous russet specks; flesh deep orange, rich, juicy, good. English. Flowers small. Valuable for its early maturity, ripening quite early, or three weeks before the close of summer. Often mildews badly.

Section II. Leaves with reniform glands.

BOSTON. (Perkins, Lewis.) Large, handsome, roundish-oval; bright yellow, with a deep red cheek; flesh yellow to the stone,

with a good, pleasant, but not very high flavor. Flowers small. Season medium, or about the first of autumn. A native of Boston.

Pitmaston Orange. Large, roundish ovate, base broad, apex narrow and pointed; surface with a dark reddish cheek, slightly streaked at the margin, on rich orange; flesh deep yellow, red at the stone, juicy, rich, fine. Flowers small. Stone rather small. Rather early.

DIVISION II.—CLINGSTONES.

Class I.—Flesh pale.

Section I. Leaves serrate, without glands.

Early Newington. (Black, Early Black, Lucombe's Seedling.) Large, roundish-ovate, one side slightly enlarged, apex pointed; skin pale green, nearly covered with bright red and with darker marblings and dots; flesh greenish white, deep red at the stone, juicy, with a fine, rich flavor. Flowers large. First of autumn.

Newington. (Scarlet Newington, Scarlet, Old Newington, Smith's Newington, Anderson's.) Rather large, roundish; nearly covered with red and darker marblings, on pale greenish yellow; flesh deep red at the stone, juicy, rich, vinous. Rather late. Flowers large. Best when ripened to shrivelling.

Class II.—Flesh yellow.

Section I. Leaves with reniform glands.

Red Roman. (Roman, Old Roman, Brugnon Musquée.) Large, roundish, a little flattened at apex; skin greenish-yellow, with a somewhat rough, dull reddish brown cheek, with brown russet specks; flesh firm, greenish-yellow, deep red at the stone, rich, vinous, high flavored. Flowers large. Season medium or rather late.

CHAPTER V.

THE APRICOT.

It is remarkable that a fruit of such excellence as the Apricot, and ripening from one to two months before the best early peaches, should be so little known. In its natural character, it is more nearly allied to the plum than the peach, resembling the former in its broad leaf, and in the smooth stone of its fruit; but downy like the peach, and partaking largely of its flavor and excellence.

The apricot is budded on seedling apricots, and on peach and plum stocks. Plum stocks are preferred, and are more especially adapted to heavy soils; on light soils, the hard-shelled almond, and the wild plum, have proved excellent.

The soil should be deep and dry. Young trees have frequently perished from a wet sub-soil, even where the surface is not unusually moist. On suitable soils, it is as hardy as most early peaches. The trees have been commonly planted in the warmest situations, as on the warm side of buildings, or other sheltered site, facing the hot sun, where they have blossomed early, and as a consequence, the crop has not unfrequently been destroyed by vernal frosts. Hence, a northern or more exposed aspect, would be far preferable. If trained on a building, the eastern side should be especially avoided, as a hot morning sun upon frosted buds would be nearly certain destruction.

The liability to the attacks of the curculio, and the very common destruction of the whole crop by this insect, has led to the erroneous conclusion that the apricot is not suited to our northern climate. Several cultivators, as far north as forty-three degrees of latitude, by a systematic destruction of this insect, and by selecting a dry sub-soil, often obtain heavy crops of this delicious midsummer fruit. The mode of protection is fully described in the chapter on insects.

VARIETIES.

Albergier. (Alberge.) Small, roundish, slightly compressed, deep yellow, flesh reddish, firm, with a rather brisk flavor; stone compressed. Rather late. Leaves with stipules. For preserving.

Black. (Purple Apricot, Noir, Violet.) Small or medium, round; pale red where densely shaded, dull deep purple or nearly black in the sun, surface with a thin down; flesh red near the skin, yellowish at the stone, somewhat fibrous, sweet, slightly astringent, with a pleasant good flavor. Kernel sweet. Adheres to the stone. Hardy as an apple-tree, and very productive. A distinct species (*A. dasycarpa*) from the other apricots. Ripens with the Breda. Reproduces itself from the stone. Shoots quite slender, greenish. There is another quite different apricot, called Violet or Red Angoumois; small, oblong, lighter red, free from the stone. Rare.

BREDA. (Holland, Amande Aveline.) Rather small, sometimes nearly medium (an inch and a half diameter), roundish, obscurely foursided, suture distinct; surface orange, with a dark reddish orange cheek; flesh deep orange, free from the stone, rich, and high flavored. Sweet kernel. Quite early, or a week or two after midsummer. Hardy for an apricot, and very productive.

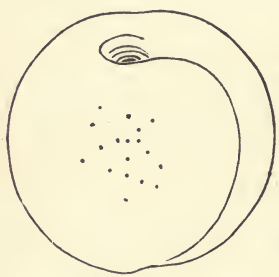

Fig. 360.—*Breda.*

Brussels. Size medium, rather oval, compressed; pale yellow, dotted white in the shade, russety brown to the sun, suture deep at base; flesh yellow, rather firm, moderately rich. Rather late.

Burlington. Rather large, oblong, suture distinct, skin golden yellow, dotted red, and a blush to the sun; flesh yellowish, sweet, good. Last half of July. N. J.

EARLY GOLDEN. (Dubois' Apricot.) Small, an inch and a fourth in diameter, round-oval, nearly smooth, suture narrow, distinct; surface wholly pale orange; flesh orange, moderately juicy, sweet, good, free from the stone. Kernel sweet. Early, or ten days before the Moorpark. Hardy, very productive, profitable for market. Origin, Dutchess co., N. Y.

Hemskirke. Large, roundish, compressed; surface orange, with a red cheek; flesh bright orange, rich, juicy, sprightly. Kernel bitter. Stone rather small. Resembles Moorpark, but smaller, a little earlier, and stone not perforate. English.

Lafayette. Very large, oval, light yellow, marbled red in the sun; flesh high flavored and excellent. Ripens in August. City of N. Y.

Large Early. Size medium, oblong, compressed, suture deep, slightly downy; pale orange, with a spotted bright orange cheek,

Fig. 361.—*Large Early.*

very handsome; flesh free from the stone, pale orange, rich, juicy. Ripens at or a little before midsummer. South of France.

MOORPARK. (Anson's, Dunmore's Breda, Temple's.) Large (two inches in diameter), nearly round, slightly compressed; surface orange, with a deep orange red cheek, and with numerous darker dots; flesh free from the stone, bright yellowish orange, rather firm, quite juicy, with a rich, high flavor. Kernel bitter. Stone perforate, or with a hole lengthwise under one edge, so that a pin may be thrust through. Season medium, or two weeks after midsummer. Requires the shortening-in pruning recommended for the peach. English. Old.

Musch. (Musch-Musch.) Rather small, round, deep yellow, with a slight orange red cheek; flesh yellow, translucent, tender, sweet. Tree rather tender. Little known in this country. Origin, Musch, in Asia Minor.

Orange. (Early Orange, Royal Orange, Royal George, Persian, Royal Persian.) Size medium, roundish, suture distinct, deep at base; surface orange, often a ruddy cheek; flesh dark orange, half dry, partly adhering to the stone—dry and poor unless house-ripened. Stone small, roundish. Kernel sweet. Culinary. Ripens at midsummer.

PEACH. (Anson's Imperial, Pêche, De Nancy.) Very large, slightly larger than Moorpark, roundish, yellowish orange, with a brownish orange cheek, and mottled with dark brown to the sun; flesh rich yellow, juicy, with a rich, high flavor. Kernel bitter. Stone perforate. Ripens about the time of the Moorpark, which it closely resembles, but is of larger size. Origin, Piedmont.

Red Masculine. (Early Masculine, Brown Masculine, Abricotin, Abricot Precoce, Abricotier Hatif.) Small, nearly round, suture distinct; bright yellow, with deep orange cheek and red spots; flesh yellow, slightly musky, sub-acid; stone thick, obtuse at ends. Kernel bitter. Flowers rather small. Very early or about midsummer. Hardy for an apricot. Valuable only for its earliness.

Ringgold. Large, roundish, slightly oblong, light orange, darker in the sun; flesh yellow, juicy, excellent. Ripens soon after the Orange. Ga.

Roman. (Abricot Commun.) Medium in size, rather oval, compressed, suture small or obscure; surface pale yellow, with a few red dots to the sun; flesh very fine grained, half juicy, with a mild pleasant flavor. Kernel bitter. Worthless in England, but greatly improved by our warm summers. Productive. Season rather early or medium, or two weeks after midsummer. It is disseminated in this country under various erroneous names.

The Blotch-leaved Roman differs only in the yellow spot or stain of its leaves.

Royal. Rather large, round-oval, slightly compressed, suture shallow; dull yellow, faintly reddened to the sun; flesh pale orange, firm, juicy, sweet, high flavored, slightly sub-acid, free from the large, oval, nearly impervious stone. Kernel bitter. Ripens a week before Moorpark, smaller than the latter, and with a less bitter kernel. French.

Shipley's. (Blenheim.) Large, oval, surface orange; flesh deep yellow, juicy, rather rich; stone roundish, not perforate. Kernel bitter. Inferior to Moorpark, but rather earlier. English.

Texas. Small, round, dark maroon; flesh juicy and pleasant, astringent at stone—clingstone. Athens, Ga.

Turkey. Size medium, round, not compressed; surface deep yellow, with a mottled, brownish, orange cheek; flesh pale yellow, firm, juicy, with a fine mixture of sweet and acid; very free from stone. Rather late, or middle of August. Somewhat resembles Moorpark, but differs in being rounder, paler, with an impervious stone, and sweet kernel.

The Blotch-leaved, or Golden Blotched, is identical with the preceding, with a yellow spot on the centre of each leaf.

White Masculine. (White Apricot, Early White Masculine, Abricot Blanc.) Small, roundish, nearly white, rarely a faint reddish cheek, rather downy; flesh white, delicate, a little fibrous, adhering to the stone. Kernel bitter. Closely resembles the Red Masculine, except in color and being rather better, and four or five days later.

CHAPTER VI.

THE PLUM.

RAISING THE YOUNG TREES. The plum is propagated by budding or grafting on seedling plums. For this purpose the stones of such varieties should be chosen as are of large and thrifty growth; and they are to be treated in planting precisely as directed for the peach, with additional care to prevent the drying of the stones, which occurs much sooner in consequence of their smaller size and thinner shell. If not cracked, a part only will vegetate the first year, although many may be made to open by the repeated action of freezing and thawing.

Stocks. On light or unfavorable soils, most of the common varieties produce feeble and slowly growing seedlings; an excellent substitute will be found in the larger sorts of the wild plum, sometimes known as the Canada plum (*Prunus Americana*). Those varieties which are found to outgrow this stock, should be worked at the surface of the ground, and when transplanted the place of union should be set a few inches lower. On strong soils, where the plum grows freely, the common *Horse plum* (a blue, oval, rather acid sort) makes the best stocks. The French *St. Julien* is similar in character. The *Myrobolan*, or cherry plum, although slender in growth, succeeds better on light, sandy, or gravelly soils, and is also, like the Canada plum, employed as stocks for dwarfs.

On light soils, the peach has been occasionally employed. A very few varieties take readily and grow freely, and large healthy trees have in some instances been produced; but the great uncertainty which attends its use, and the failure with most varieties, indicate the propriety of the rejection of the peach for this purpose.

Grafting, to succeed best, should be done quite early in spring, before the buds have commenced swelling; and budding must be performed while the stocks are at the period of their most vigorous growth (provided sufficiently matured buds can be found), which is

usually soon after midsummer. If deferred, the bark will not peel freely, and the buds will not adhere.

The time required to attain a sufficient size for the orchard, varies much with different sorts. The Imperial Gage, the Washington, Huling's Superb, and others, grow rapidly, and usually produce good trees in two years from the graft or bud; while such slow-growing plums as the Primordian, Green Gage, and Red Diaper, require a longer period.

Soil. The best soil, usually, is a strong, rich, clayey loam. On many light soils the tree grows with less vigor, independently of which the crop is more frequently destroyed by the curculio, a pervious soil affording a more ready place of shelter for the young insects, on their escape from the fallen fruit. A few varieties are well adapted to rather dry as well as light lands.

In planting orchards, a suitable distance is one rod apart, giving one hundred and sixty trees to the acre. The ground should be manured and kept well cultivated, as the plum, especially when young, is sensitive to the effects of the weeds and grass of neglected culture.

ARRANGEMENT OF VARIETIES.

DIVISION I.—*Red, Purple, or Blue.*

DIVISION II.—*Green, White, or Yellow.*

DIVISION I.—RED, PURPLE, OR BLUE.

Blue Imperatrice. (Imperatrice.) Size medium, obovate, narrowed to the base in a somewhat conic neck; skin deep purple, bloom copious, blue; stalk three-fourths of an inch long, slightly sunk; flesh greenish yellow, rather firm, not juicy, rich, sugary; ripening very late, and hanging till nearly winter.

The variety known erroneously as the *Semiana* or *Blue Imperatrice* of Boston, and disseminated as such, differs from the true Imperatrice in its shorter and smaller neck, much shorter and not sunk stalk, and more acid flavor. It is very productive, and a good very late culinary sort.

BRADSHAW. Large, obovate, with an obtuse suture on one side, sometimes with a very slight neck; color dark purple, with a light blue bloom; stalk three-fourths of an inch long, cavity nar-

row; flesh a little coarse, becoming light brownish purple, at first adhering but becoming nearly free from the stone when fully

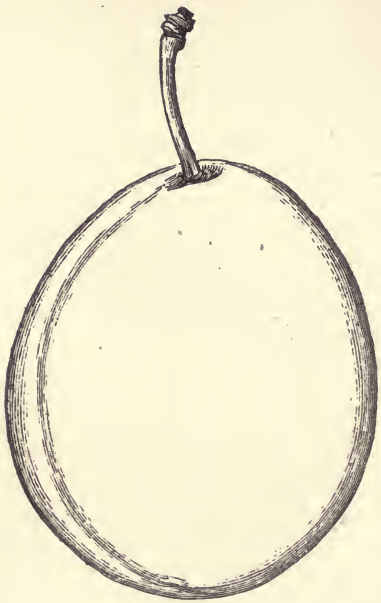

Fig. 362.—*Bradshaw.*

ripe; juicy, good, slightly acid. Tree vigorous, shoots purple, smooth. Last of August.

Brevoort's Purple. (New York Purple.) Large, oval, suture distinct at base; skin reddish, with a violet bloom, stalk three-fourths of an inch long, cavity deep, narrow; flesh soft, juicy, sub-acid, moderately rich, second-rate. Season medium. Shoots long, smooth; tree productive. Origin, New York.

Cherry. (Early Scarlet, Myrobolan.) Small (one inch in diameter), round, remotely heart-shaped, bright red, bloom faint; stalk short and slender; cavity narrow; flesh juicy, slightly fibrous, soft, melting, sub-acid, not rich, adhering to the oval, pointed stone. Ripens very early or about midsummer, its only value. This is a distinct species (*Prunus cerasifera*), and is distinguished by its smooth, slender shoots, small bushy head, and narrow leaves. There are several varieties.

The *Golden Cherry Plum* (Market Plum, of Hoffy) is heart-shaped,

yellow, speckled with scarlet in the sun, productive, and slightly earlier than the common cherry plum.

Coe's Late Red, or *Red St. Martin.* (St. Martin, Saint Martin Rouge.) Size medium, roundish, suture distinct on one side, skin light purplish red, bloom thin, blue; stalk three-fourths of an inch long, scarcely sunk; flesh rather firm, crisp, rich, vinous. Very late, productive, shoots downy. A valuable late plum.

Fig. 363.—*Coe's Late Red.*

COLUMBIA. (Columbian Gage.) Very large, nearly globular, one side slightly larger; skin brownish purple, reddish brown where much shaded, with many fawn-colored dots; bloom blue, copious; stalk one inch long, rather stout; cavity small; flesh orange, moderately juicy, rich, rather coarse, free from the small, compressed stone, or adhering at the edge; flavor good. Fruit liable to rot. Season medium, or end of summer. Shoots downy, stout, blunt, spreading, leaves nearly round.

Corse's Nota Bene. Rather large, round, surface pale lilac brown, often dull green in the shade; bloom light blue, copious; stalk half an inch long, cavity round; flesh greenish, rather firm, crisp, rich, vinous. Very late, very productive, shoots downy.

Cruger's Scarlet. (Cruger's, Cruger's Seedling.) Medium, approaching small, roundish-oval, suture obscure; surface lively red, or bright lilac, with numerous yellow dots, pale fawn color in the shade, bloom thin, bluish; stalk half an inch long, cavity shallow; flesh deep orange, moderately juicy, mild, agreeable, not rich, good. Season medium. Shoots downy. Hardy, adapted to light soils, very productive. Origin, New York.

DAMSON. (Common Damson, Early Damson, Purple Damson, Blue Damson.) Small, oval (an inch long), purple, bloom thick, blue; melting, juicy, sub-acid, partly free from stone. Early autumn. Profusely productive.

The *Sweet Damson* is less acid. The *Winter Damson* is small, round, purple, bloom copious, with an acid, slightly astringent flavor; it bears enormous crops, which hang uninjured till late in autumn. The Damson makes good preserves. There are several sub-varieties.

De Delice. Size medium, roundish-oval, with a slight neck; skin green, marbled and shaded with violet, and covered with a thin

bloom; stalk three-fourths of an inch long, rather stout, very slightly inserted; flesh orange yellow, juicy, melting, with a rich, sugary, luscious flavor, adheres slightly to the stone. End of September, and lasts long. Foreign. (Downing.)

De Montford. Size medium, roundish-oval, dull purple, streaked and dotted with russet; stalk medium, rather stout, not sunk; flesh greenish, juicy, sweet, and rich—adhering to the stone. Last of August.

Denniston's Red. Medium or rather large, roundish-oval, narrowed to the stalk; suture passing half round; surface a fine light red, with fawn-colored dots; bloom very thin; stalk very long, slender, little sunk; flesh amber-colored, rich, of moderate quality, free from the small, oval, compressed stone. Season medium, or last of summer. Shoots smooth. Origin, Albany, N. Y.

Domine Dull. (German Prune, of some.) Size medium, long-oval, suture very obscure; skin very dark purple, bloom blue; stalk three-fourths of an inch long, scarcely sunk; flesh juicy, becoming dry, rich, sweet, good. Profusely productive. Rather late. Origin, Kingston, N. Y.

DUANE'S PURPLE. Very large, oblong-oval, longer on one side; slightly narrowed towards the stalk; skin reddish purple, bloom lilac; stalk three-fourths of an inch long, slender, cavity narrow; flesh juicy, moderately sweet, of moderate flavor, adhering mostly to the stone. Rather early, ripening last half of August. Shoots very downy, leaves large, downy beneath. Origin, Duanesburgh, N. Y.

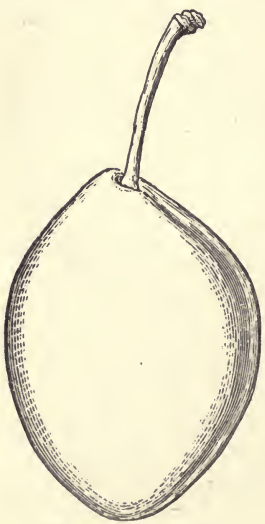

Fig. 364.—*Fellenberg.*

Early Tours. (Précoce de Tours, Early Violet.) Medium or small, deep purple, bloom copious, blue; stalk half an inch long, cavity narrow; flesh dull yellow, slightly fibrous, rather sweet, melting, good. Quite early. Shoots downy.

FELLENBERG. (Italian Prune.) Medium, oval, pointed and tapering at ends; suture small, distinct; dark purple, with dark blue bloom; stalk an inch long, scarcely sunk; flesh greenish yellow, juicy, sweet, of good quality—freestone. Last of August.

Fotheringham. Size medium, obovate, suture distinct; skin purple in the sun, reddish in the shade, bloom

pale blue; stalk an inch long; flesh pale greenish yellow, juicy, sprightly, moderately rich. Rather early. Shoots smooth. English. Old.

Frost Gage. Rather small, round-oval, suture distinct on one side; skin deep purple, bloom thin; stalk half to three-fourths of an inch long, scarcely sunk; flesh juicy, sub-acid, becoming sweet, melting, of fine but not of the highest flavor; much subject to black knot. Shoots smooth, rather slender; tree tall, upright.

GERMAN PRUNE *or* QUETSCHE. Large, long-oval, curved or swollen on one side, with a long tapering neck to the stalk; suture distinct; skin purple, with a thick blue bloom; stalk three-fourths of an inch long, slender, slightly sunk; flesh green, firm, sweet, pleasant, not rich, free from the very long, flat, slightly curved or lunate stone; valuable for drying and preserving. Rather late. Shoots smooth. There are several sub-varieties.

Goliath. Large, roundish-oblong or oval, enlarged on one side; skin deep red, approaching blue or purple; bloom thin, blue; stalk half or three-fourths of an inch long, cavity very deep, distinct; flesh yellowish, mostly adhering to the stone, juicy, coarse, sub-acid. Season medium. Shoots grey, very hairy, leaves narrow. Productive. Bears early—profitable.

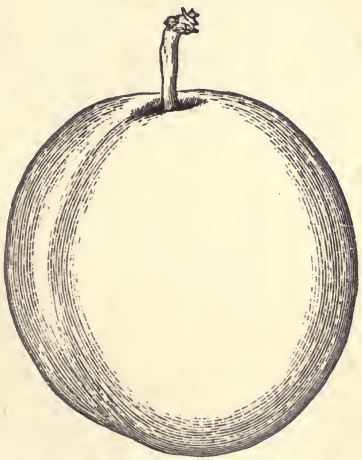

Fig. 365.—*Goliath.*

Highlander. Large, ovate, irregular; deep blue with a brownish tinge; stalk very short, slightly sunk; juicy, rich, vinous, refreshing, excellent. End of September.

Howell's Early. Rather small, oval, slightly angular, suture obsolete; skin light brown, often greenish yellow in the shade; bloom thin, blue; stalk three-fourths of an inch long, slender, not sunk; flesh amber-colored, juicy, sweet, perfumed, free from the small, oval stone. First of August. Shoots slender, grey, downy; tree productive.

Ickworth Imperatrice. Medium or rather large, obovate, purple, with irregular streaks of fawn color; stalk medium; flesh greenish yellow, sweet, juicy, rich, mostly adhering to the rather small stone. Very late, keeping into winter, becoming dryer and sweeter. Shoots smooth. English.

Isabella. Medium in size or large, oval, slightly narrowed to the base; skin dark dull red, dotted darker; stalk three-fourths of an inch long, a little hairy, cavity moderate; flesh yellow, rich, juicy, and slightly adhering to the pointed stone. Shoots quite downy. Season medium. English.

Italian Damask. Size medium, nearly round, slightly flattened at base; suture distinct, passing from base to apex; surface violet, becoming brown; stalk half an inch long, slender, cavity small, round; flesh yellowish green, firm, sweet, high flavored, very free from the oval, rather thick stone. Season medium. Shoots smooth.

Judson. Rather small, roundish, slightly oval, base a little flattened, suture indistinct; surface a handsome damask or pink, slightly mottled; stalk one inch long, slender, cavity small, rather deep; flesh juicy, rich, vinous, high flavored, free from the rather large stone. Ripens first of August. Origin, Lansingburgh, N. Y.

Kirke's. Size medium, round, suture small; skin dark purple, bloom thin, blue; stalk three-fourths of an inch long, cavity slight; flesh greenish yellow, firm, rich, free from the flat, broad stone. Season medium. Shoots smooth. Resembles the Purple Gage externally. Often spurious. English.

LOMBARD. (Bleecker's Scarlet.) Size medium, sometimes rather large, round-oval, slightly flattened at ends, suture obscure; skin violet red; stalk very slender, half to three-fourths of an inch long, cavity broad; flesh deep yellow, pleasant, not rich, but of fine quality. Rather early or medium in season, ripening a week or two before the end of August. Hardy, very prolific, well adapted to light soils—valuable. Shoots thrifty, quite smooth or glossy, bright purple; leaves crumpled. Origin, Albany, N. Y.

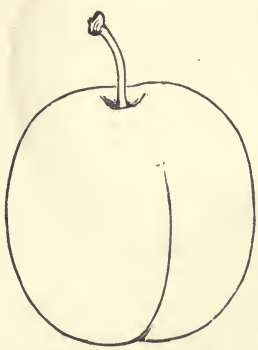

Fig. 366.—*Lombard.*

This is a strongly fixed variety, and has in many instances produced seedlings very closely resembling itself.

Manning's Long Blue. (Large Long Blue, Manning's Long Blue Prune.) Large, long, oval, slightly one-sided, suture obscure; stalk very long, slender, scarcely sunk; skin dark purple, bloom thick, blue; flesh firm, rather juicy, nearly free from the long, pointed stone. Rather late, ripens gradually. Shoots smooth. Tree very productive.

Meigs. Large, roundish-oval, suture indistinct, dull reddish purple, with numerous grey dots; stalk long, slender, curved, slightly

sunk; flesh greenish yellow, rich, excellent, adhering to stone. End of September.

Morocco. (Italian Damask *erroneously*, Early Morocco, Black Morocco, Early Damask, Black Damask.) Size medium, roundish, slightly flattened at ends; suture on one side only, shallow, skin dark purple, bloom pale, thin; stalk half an inch long, rather stout; flesh greenish yellow, adhering slightly to the stone, rich, rather acid, becoming sweet. Not first-rate, but valuable for its earliness, ripening ten days before the Washington. Shoots downy. A moderate bearer.

Nectarine. Large, regular, roundish; skin purple, bloom blue; stalk half an inch long, stout; flesh dull greenish yellow, often tinged with red, rather coarse, rich, acid, partly adhering to the stone. Rather early. Shoots nearly smooth, leaves broad. Quite distinct from the Peach Plum of the preceding class.

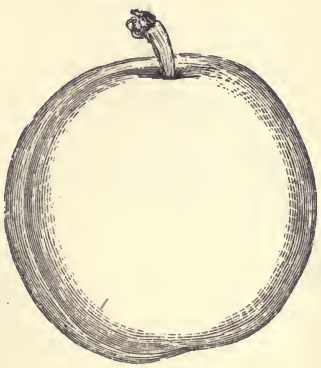

Fig. 367.—*Nectarine.*

Orleans. (Old Orleans, Red Damask, Monsieur.) Size medium, roundish, suture distinct, slightly larger on one side; skin dark red, purple in the sun; stalk one-half to three-fourths of an inch long, cavity wide; flesh yellowish, sweet mixed with acid, of second quality in richness, pleasant and good. Rather early. Shoots downy. There are two or three sub-varieties.

Orleans Early. (New Orleans, Hampton Court, Monsieur Hâtif.) Size medium, round-oval, suture shallow, stalk half an inch long, stout, or longer and slender; cavity moderate; skin reddish purple, slightly marbled; flesh yellowish green, rather rich. Early in August.

Wilmot's Orleans scarcely differs from the Early Orleans.

PEACH PLUM. (Prune Pêche.) Very large, roundish-oblate, regular, flattened at ends, suture distinct, shallow; color varying from salmon to light brownish red; stalk very short, cavity narrow, shallow; flesh rather coarse, juicy, sprightly, free from the nearly round, very flat, much furrowed stone. Shoots smooth. Quality not very high, moderate bearer, tree somewhat tender. Matures about ten days before the Washington. Shoots smooth, vigorous.

Pond's Seedling (English). Very large, ovate, slightly tapering to stalk; skin thick, reddish violet, with numerous brown dots, and

covered with a handsome bloom; rather coarse, juicy, moderately rich. Middle of September. Tree vigorous, branches smooth, greyish. A beautiful showy fruit.

Pond's Seedling, of Massachusetts, a very distinct sort, is medium in size, roundish, purple; flesh yellowish, rather dry, sweet with acid, flavor moderate or poor. Early. Shoots downy.

Prince Englebert. Large, oblong oval, deep bluish purple, with a dense bloom; stalk rather slender, with a fleshy ring at base,

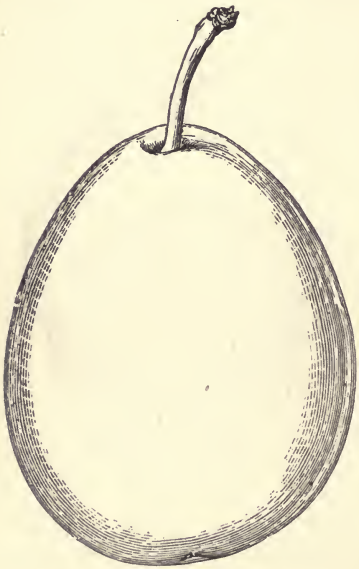

Fig. 368.—*Pond's Seedling* (English).

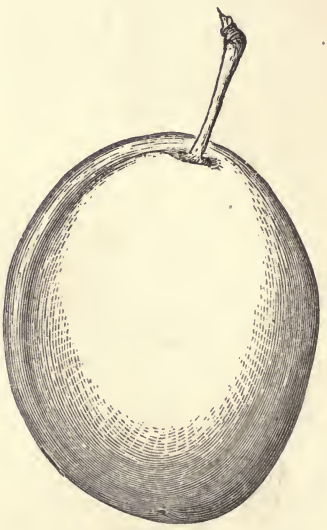

Fig. 369.—*Prince Englebert.*

cavity rather deep and narrow; flesh juicy, melting, with a pleasant, moderately rich, and very good flavor—freestone. End of August. Shoots downy. Belgian.

PRUNE D'AGEN *or* AGEN DATE. Size medium, obovate, flattened one side; skin reddish purple, bloom blue; stalk short; flesh greenish yellow, sweet. Very late, profusely productive. Shoots smooth, leaves narrow. French. Culinary.

PURPLE FAVORITE. Size medium, or rather large, round-obovate; suture obsolete; skin brownish purple; bloom thin, light blue; stalk three-fourths of an inch long, scarcely sunk; flesh pale

greenish, juicy, tender, melting, rich, sweet, excellent, free from the very small, roundish stone. Season about medium, or last week of August. Shoots nearly smooth, short-jointed, growth slow, much resembling that of the Red Diaper. Origin, Newburgh, N. Y.

PURPLE GAGE. (Reine Claude Violette, Violet Queen Claude.) Size medium, roundish, slightly flattened at ends, suture distinct, shallow; surface violet, bloom light blue; stalk an inch long, cavity narrow; flesh rather firm, greenish yellow, rich, sugary, of

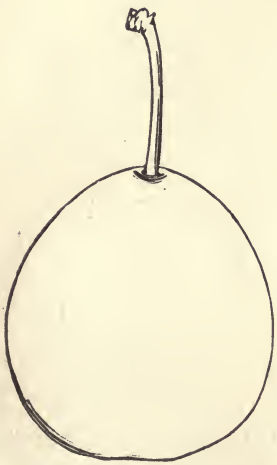

Fig. 370.—*Purple Favorite.*

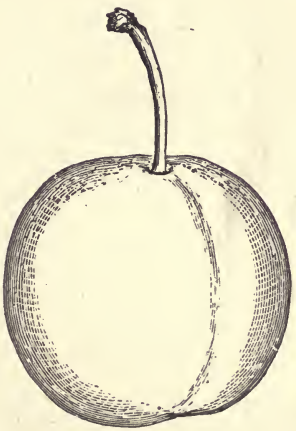

Fig. 371.—*Purple Gage.*

very high and excellent flavor, free from the oval, compressed stone. Ripens rather late, hanging long, and slightly shrivelling on the tree. Shoots smooth, resembling those of the Green Gage. A spurious sort is often disseminated.

Quackenboss. Large, oblong-oval, deep purple, suture faint, stalk short, slightly sunk; slightly coarse, sprightly, very good, partly freestone. October. Albany, N. Y.

RED DIAPER. (Diaprée Rouge, Mimms, Imperial Diadem.) Large, obovate, somewhat necked; skin reddish purple, with a few yellowish specks, bloom light blue; stalk three-fourths of an inch long, slender, slightly hairy, little sunk; flesh pale green, juicy, melting, rich, of fine flavor; free from the quite small stone. Season medium or end of summer. Shoots nearly smooth; growth slow.

Red Gage. Medium or rather small, round-ovate, brownish red, stalk rather slender, cavity narrow; flesh greenish amber, juicy, melting, rich, mild, sweet, free from the small stone; flavor unusually pleasant and refreshing. Rather early. Shoots dark

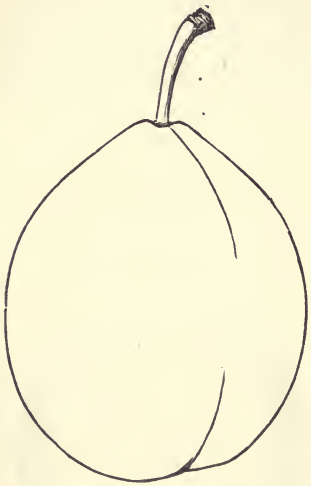

Fig. 372.—*Red Diaper.*

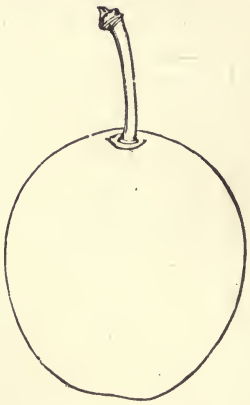

Fig. 373.—*Red Gage.*

reddish, smooth; leaves of the young trees deep green, crimpled. Origin, Flushing, Long Island.

Red Magnum Bonum. (Purple Egg, Red Imperial, Purple Magnum Bonum, Imperial Violet, Red Egg.) Large, oval, tapering to the stalk, suture strong, one side swollen; surface deep red in the sun; bloom thin; stalk an inch long, slender, cavity narrow; flesh greenish, coarse, firm, sub-acid; valuable only for cooking. Season medium. Shoots smooth. Some sub-varieties are clingstones.

Rivers' Early Favorite. Rather small, roundish-oval, with a shallow suture, nearly black with russet dots, bloom blue; flesh greenish yellow, juicy, excellent. Very early, immediately succeeding Primordian, and better in quality. English. New.

Royale. (Royal, La Royale.) Size medium, sometimes rather large, round, slightly narrower towards the base, or approaching obovate; suture distinct on one side at apex; skin reddish purple, bloom very thick; stalk three-fourths of an inch long, cavity narrow; flesh dull yellow, rather firm, melting, juicy, rich, of excel-

lent flavor. Ripens first of September. Shoots very downy, growth slow, tree spreading, moderately productive. French.

ROYALE HATIVE, *or* "EARLY ROYAL." (Mirian.) Size medium, roundish, slightly wider at base; skin light purple, stalk half an inch long, stout, scarcely sunk; flesh amber yellow, with a rich,

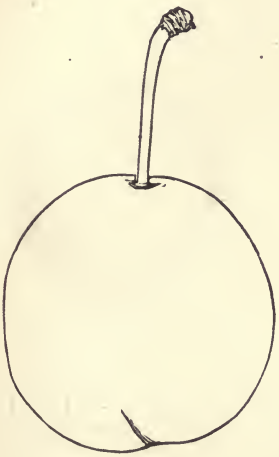

Fig. 374.—*Royale.*

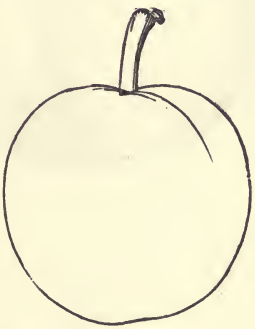

Fig. 375.—*Early Royal.*

high flavor, nearly free from the small, flattened, ovate stone. Very early. Resembles Purple Gage, but a month earlier. Shoots very downy. French. Rare.

ROYAL TOURS. (Royale de Tours.) Large, roundish, suture deep, half round, one side swollen; a white depressed point at apex; skin red in the shade, deep violet in the sun, bloom copious, blue; stalk half to three-fourths of an inch long, cavity narrow; flesh greenish white, rather firm, juicy, rich, high flavored, adhering closely to the large, oval, flattened stone. Quite early; shoots quite downy. Valuable for its earliness and good quality. The genuine sort is very rare. French.

SCHENECTADY CATHERINE. Size small or nearly medium, roundish, slightly narrowed to the apex; suture rather shallow; skin deep purple-violet in the shade, slightly netted on the sunny side; stalk three-fourths of an inch long, slender, cavity deep, narrow; flesh greenish yellow, melting, sweet, rich, excellent, next to the Green Gage in quality, ripening last of August. Shoots rather slender, smooth. Tree extremely hardy, productive, and reliable.

This is quite a distinct variety, often reproducing itself from seed, not perceptibly varying from the parent.

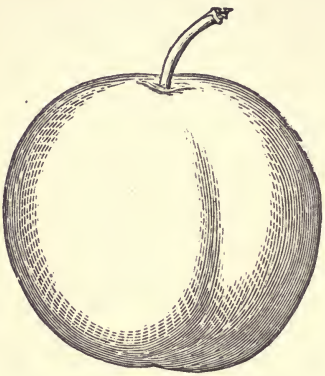

Fig. 376.—*Royal Tours.*

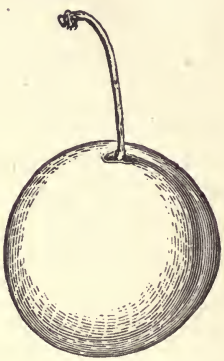

Fig. 377.—*Schenectady Catherine.*

Sharp's Emperor. Quite large, roundish-oval; skin a bright red, paler in the shade, bloom delicate; flesh deep yellow, pleasant, moderately rich. Very productive. Shoots strong, downy, leaves large. English. Showy. One of the best market sorts.

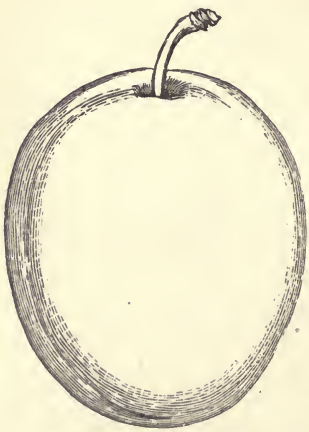

Fig. 378.—*Sharp's Emperor.*

Smith's Orleans. Large, oval, slightly wider at base, a little irregular, suture deep on one side; skin reddish purple, becoming very dark, bloom deep blue; stalk small, slender; cavity narrow, deep; flesh deep yellow, slightly firm, juicy, rich. Shoots vigorous, straight, glossy reddish purple; leaves dark green, crimpled. Ripens the last week of August. Productive in nearly all soils. Long Island.

Suisse. (Prune Suisse, Swiss Plum, Simiana, Monsieur Tardif.) Medium or rather large, round, suture broad, shallow; a sunk point at apex; skin lively violet red, thickly dotted, and slightly marbled; bloom blue, copious; stalk three-fourths to an inch long, cavity

wide; flesh crackling and melting, flavor brisk, rich, slightly sharp, adhering to the thick, rough-edged stone. Quite late. Shoots smooth. Distinct from the "Semiana," of Boston.

Thomas. Large, round-oval, slightly irregular, somewhat compressed on the suture; skin salmon color, with a soft red cheek and numerous dots; stalk hairy, one-half to three-fourths of an inch long, stout; cavity small, narrow; flesh pale yellow, somewhat coarse, mild, pleasant, free from the very light-colored stone. Shoots slightly downy. Productive. Season medium. Origin, Boston.

Victoria. Large, obovate, suture distinct, color a fine light reddish purple; stem half an inch long, cavity rather deep and narrow; flesh yellow, pleasant—clingstone. It has been long known in

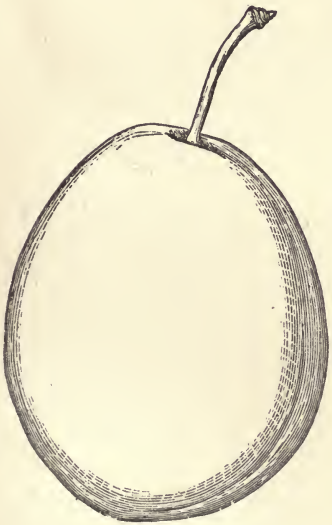

Fig. 379.—*Victoria.*

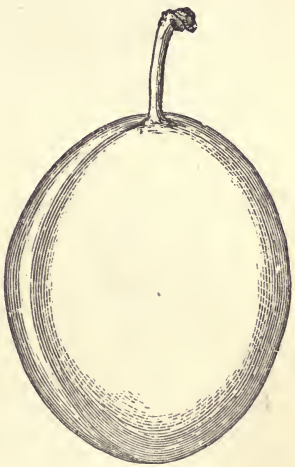

Fig. 380.—*Wangenheim.*

some parts of England—stands next to Pond's Seedling in size, beauty, and productiveness. A great grower, irregular. Distinct from, and better than Sharp's Emperor.

Wangenheim. Medium, oval, suture shallow but distinct, dark blue, stem short, set without depression; flesh greenish yellow, juicy, firm, sweet, rich, "very good," partly free from the rather large stone. German, a sort of prune. Growth erect, moderately vigorous, tree very productive. One of the best of its class.

Wax. Large, slightly oval, rich yellow, mostly covered with red bloom lilac, stalk long; flesh greenish yellow, juicy, sprightly, freestone. October. Albany, N. Y.

Division II.—Green, White, or Yellow.

Albany Beauty. (Denniston's Albany Beauty.) Size medium or rather small, roundish-oval, with a slight neck at base, suture obscure; surface pale whitish green, purple dots numerous, bloom thin; stalk an inch or more long, slender, scarcely sunk; flesh yellow, moderately juicy, rich, sweet, free from the small, pointed stone. Ripens the last week in August. Shoots slightly downy. Origin, Albany, N. Y.

Apricot. (French Apricot.) Size medium or rather large, roundish, suture deep; stalk scarcely half an inch long; surface yellow, dotted and tinged with red in the sun; bloom white; flesh yellow, rather firm, slightly bitter, becoming, when ripe, melting, juicy, and pleasant. Rather early. Shoots quite downy.

The English Apricot plum is a third-rate, clingstone, oval fruit, with smooth shoots.

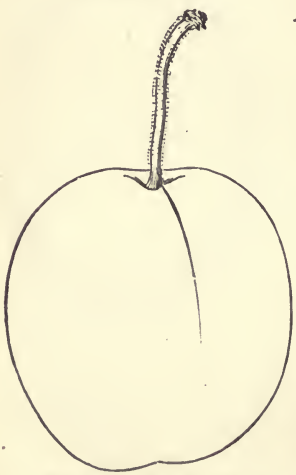

Fig. 381.—*Bleecker's Gage.*

Autumn Gage. (Roe's Autumn Gage.) Size medium, ovate, slightly conical; stalk three-fourths of an inch long, not sunk; surface pale yellow, bloom thin, whitish; flesh greenish yellow, juicy, sweet, delicate, pleasant, free from the long, pointed, compressed stone. Leaves pointed, shoots smooth, spreading. Ripens rather late. Growth very slow. Very productive. Origin, Newburgh, N. Y.

Bleecker's Gage. Size medium; roundish-oval, regular, suture obscure; stalk an inch long, rather stout, downy, slightly sunk; skin yellow, with sunken white specks; bloom thin, white; flesh yellow, rich, sweet, luscious, partly free from the pointed stone. Ripens at the end of summer. Shoots downy. Distinguished from Prince's Yellow Gage by its larger stalk and later maturity. Origin, Albany, N. Y.

Bingham. Large (an inch and three-fourths long), oval, rather widest at base; surface deep yellow, with rich red spots to the sun; stalk slightly sunk; flesh yellow, juicy, rich, delicious. Season of ripening medium, or end of summer and first of autumn. Shoots downy. Handsome, productive, and valuable. Origin, Pennsylvania.

Buel's Favorite. Rather large, ovate, broadest at base; suture distinct half round; stalk two-thirds of an inch long, rather stout, little sunk; surface pale green, thickly sprinkled with lighter dots, base with reddish specks; flesh greenish yellow, rather firm, juicy, rich, high flavored, adhering to the long pointed stone. Ripens at the close of summer. Shoots smooth, reddish. Origin, Albany, N. Y.

Coe's Golden Drop. Very large (often more than two inches long), oval, suture distinct, one side more enlarged, necked; light yellow, often dotted red to the sun; stalk three-fourths of an inch long, rather stiff; flesh yellowish, rather firm, rich, sweet, not fine grained, closely adhering to the pointed stone. Quite late, does not always ripen at the North—requires a long season. An excellent late sort, ot English origin. Shoots smooth, rather glossy.

Dana's Yellow Gage. Size medium, oval, pale yellow, marbled with darker green, bloom very thin; flesh juicy, lively. Season medium. Very productive. Hardy. Mass.

Denniston's Superb. Size medium; round, obscurely oval, slightly flattened, suture distinct; surface pale yellowish green, slightly dotted and clouded with purple, bloom thin, stalk rough, three-fourths of an inch long, moderately sunk; flesh thick (stone small), not juicy, rich, vinous, free from the thick, roundish stone. Ripens rather early, or last fortnight of summer. Resembles Green Gage, rather larger, earlier, and not so good. Shoots downy. Very productive. Origin, Albany, N. Y. One of the handsomest of plums.

Downton Imperatrice. Size medium, oval, base tapered or with a neck; skin thin, pale yellow; flesh yellow, melting, acid, becoming rather sweet. Ripens late, or end of September. Shoots smooth, long, strong, upright. For preserving. A cross of the White Egg and Blue Imperatrice.

Drap d'Or. (Yellow Perdrigon, Mirabelle Grosse.) Rather small, round, suture indistinct, apex dimpled; stalk half an inch long, slender; surface golden yellow, sometimes a few crimson dots to the sun; flesh yellow, sweet, rich, often half dry, partly adhering to the stone; ripens a week before the Green Gage. Shoots slightly downy, growth slow.

Drap d'Or of Esperin. Large, roundish-oval, golden yellow, stalk short, stout, little sunk; flesh yellowish, rather coarse, juicy, sweet, rich—freestone. Last of August. Early Yellow Prune. Rather

large, oval, yellow, dotted red; stalk medium, slightly sunk; sweet, juicy, slightly melon-flavor—freestone. Middle of August. Great bearer.

Fulton. Medium, oval approaching ovate; suture distinct; bright yellow; stalk and cavity medium; flesh yellow, juicy, with a rich, high flavor. October. Tree vigorous, productive, fruit hangs long.

General Hand. Very large, roundish-oval, skin deep golden yellow, stalk long; flesh moderately juicy, not high flavored—freestone. Shoots nearly smooth. First of September.

GREEN GAGE. (Reine Claude, Bruyn Gage.) Rather small, round; suture faint; surface green, becoming yellowish green, usually

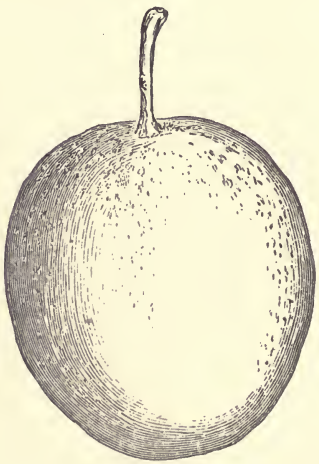

Fig. 382.—*Fulton.*

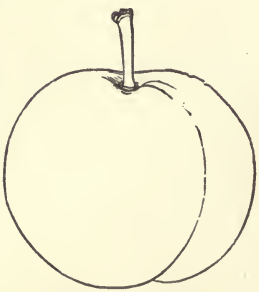

Fig. 383.—*Green Gage.*

with reddish brown dots and network at base; stalk half to three-fourths of an inch long, scarcely sunk; flesh pale green, melting, juicy, exceedingly sweet and rich, and unequalled in flavor. Ripens about the middle of August. Shoots smooth, buds with large shoulders, growth slow, and young trees difficult to raise in most localities. French. Old. There are many seedlings, inferior to the original, and many worthless green plums called by this name.

Henry Clay. Medium, oval, suture slight, yellow, marbled and shaded red; stalk long, slender, scarcely sunk; juicy, sweet;

stone small, nearly full. End of August. A handsome and productive variety. Albany, N. Y.

Howard's Favorite. Large, necked, rich yellow, dotted and shaded with carmine, bloom lilac; stalk long, inserted in a ring; flesh rather coarse, but very sugary, rich, and delicious—somewhat adherent to the stone. September. Tree vigorous, fruit hangs long. Albany, N. Y.

Hudson Gage. Size medium; oval, suture obscure, one side slightly larger; surface yellow, clouded or streaked faint green, bloom thin, white; stalk about two-thirds of an inch long, moderately sunk; flesh greenish, juicy, melting, rich, sprightly, excellent, nearly free from the small stone. Ripens two weeks earlier than Washington, and three weeks before Imperial Gage, which it partly resembles. Origin, Hudson, N. Y.

HULING'S SUPERB. Large, round-ovate, suture shallow, indistinct; stalk one inch long, stout, slightly sunk; skin dull greenish yellow; bloom pale, thin; flesh rather firm; flavor rich, brisk, excellent. Ripens latter part of summer. Shoots thick, vigorous, downy, leaves very large. A moderate bearer. Origin, Penn.

Fig. 384.—*Huling's Superb.*

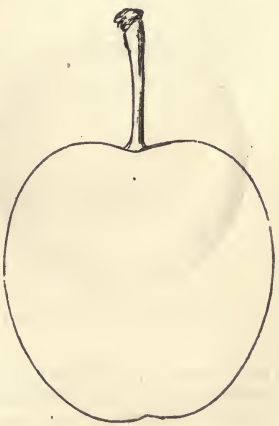

Fig. 385.—*Imperial Gage.*

IMPERIAL GAGE. (Flushing Gage, Prince's Imperial Gage, White Gage, of *Boston.*) Fruit rather large, oval, suture distinct; stalk

three-fourths of an inch long, slightly hairy, evenly sunk; surface green, slightly tinged yellow, with marbled green stripes; bloom copious, white; flesh greenish, juicy, melting, rich, sometimes adhering, but usually nearly free from the oval, pointed stone. Ripens first of autumn. Very productive. Shoots long, upright, vigorous, slightly downy; leaves with a slight shade of blue.

Imperial Ottoman. Nearly medium in size, oval, suture on one side half way from base to apex; somewhat pellucid; surface pale greenish yellow, marbled; stalk three-fourths of an inch long, downy, slender, curved, scarcely sunk; surface dull yellow, clouded darker, bloom thin; flesh very juicy, sweet, excellent, scarcely adhering to the pointed stone. Ripens first of August. Great bearer. Shoots slightly downy; tree hardy, succeeds well as far north as Maine.

Ives' Seedling. Large, ovate, suture distinct; yellow, mottled

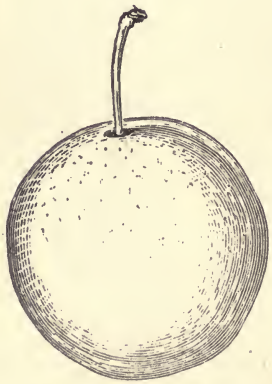

Fig. 386.—*Imperial Ottoman.*

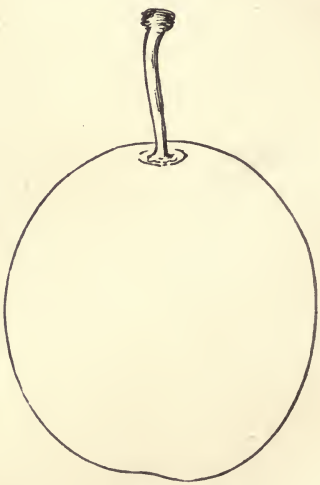

Fig. 387.—*Jefferson.*

and dotted red, bloom thin; stalk short, slightly sunk; flesh rich amber color, juicy, high flavored—freestone. First of September. Growth moderate, buds prominent. Mass.

JEFFERSON. Large, oval, base slightly narrowed, suture slight; greenish yellow, becoming golden yellow, often faintly reddened to the sun, bloom thin, white; stalk an inch long, sunk little or none; flesh rich yellow, moderately fine grained, in well ripened speci-

mens orange; very juicy, nearly free from the long, pointed stone; flavor rich, luscious, excellent. Ripens end of summer. Origin, Albany. Shoots smooth.

LAWRENCE'S FAVORITE. (Lawrence Gage.) Large, roundish, slightly oblong-oval, obtuse; surface dull yellowish green, clouded darker; bloom light bluish green; base, when ripe, with a brownish red net-work and dots; stalk half an inch long, small, cavity

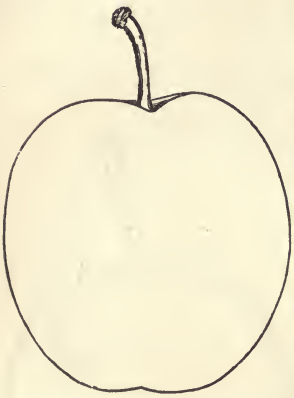

Fig. 388.—*Lawrence's Favorite.*

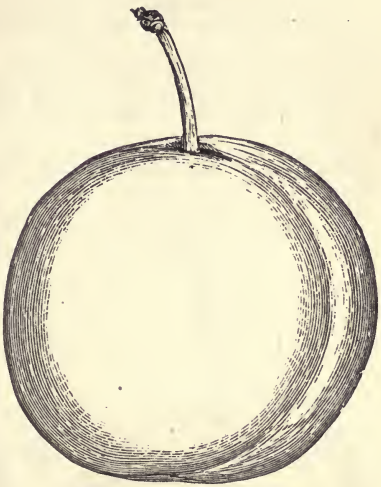

Fig. 389.—*Lucombe's Nonsuch.*

narrow; flesh greenish, melting, juicy, rich, excellent. Shoots short, rather upright, downy; leaves small, dark green. Rather early or middle of August. Origin, Hudson, N. Y.

Lucombe's Nonsuch. Medium or rather large, roundish; skin yellowish green with yellowish orange, bloom whitish; suture broad; stalk three-fourths of an inch long, cavity wide; flesh rather firm, rich, sweet, with acid.

Madison. Size medium, roundish, suture shallow; rich yellow, dotted and shaded crimson next the sun; stalk short, stout, little sunk; flesh rich yellow, slightly coarse, with a rich flavor, adheres slightly to the stone. End of September. Shoots smooth, tree vigorous. productive. Albany, N. Y. Closely resembles Dennistón's Superb.

MCLAUGHLIN. Rather large, roundish-oblate, much flattened at ends, suture obscure; stalk three-fourths of an inch long, scarcely

sunk; skin thin, tender, russet-yellow, sprinkled with thin red, purplish at base; flesh rather firm, juicy, sweet, luscious. Ripens at the end of summer. Growth vigorous, leaves large, glossy, shoots smooth. Origin, Bangor, Maine.

Mirabelle. Very large, obovate, suture distinct; stalk half an inch long, slightly sunk; surface a fine yellow, slightly spotted with red, bloom white; flesh orange, sprightly, becoming dry. Ripens with the Green Gage. Shoots downy, tree small. A small, beautiful, second-rate plum, very productive, and valued for preserving. Its seedlings are used as stocks for dwarf plums.

MONROE. Full medium, roundish-oval, greenish yellow, stalk rather long, slightly sunk; flavor rich, and good. First of September. Tree a healthy, strong grower, and great bearer. Monroe co., N. Y.

Mulberry. Large, oval, tapering, with a neck to the stalk, suture

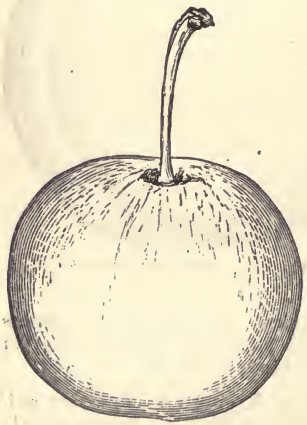

Fig. 390.—*McLaughlin.*

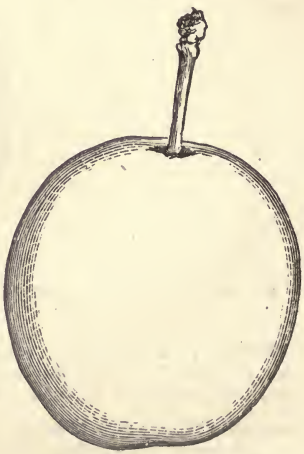

Fig. 391.—*Nelson's Victory.*

slight; pale dull yellow, with a few crimson dots; bloom thin; stalk an inch long, slender, scarcely sunk on the obtuse end of the neck; flesh greenish yellow, rather coarse, melting, rich, adhering to the large, oblong, pointed stone. Ripens the first of autumn. Shoots stout. Origin, Albany, N. Y.

Nelson's Victory. Size medium, roundish-oval, brownish yellow, with some dull red; stone small; flesh free, juicy, good, Tree vigorous, great bearer, fruit showy, fine for market. English

Orange. Very large, oval, flattened at ends, bronze yellow rough, marked with purplish red near the base; stalk three-fourths of an inch long, cavity narrow; rather coarse, acid. End of August.

Parsonage. Rather large, oval, pale yellow, stalk medium, slightly sunk; flesh yellow, juicy, with a rich, sugary flavor. Free from the stone. First of September. Tree vigorous, upright, productive. New. Dutchess co., N. Y. (Downing.)

Peters' Yellow Gage. Large, nearly oval, varying in its form, rich yellow, crimson dots next the sun; stalk three-fourths of an inch

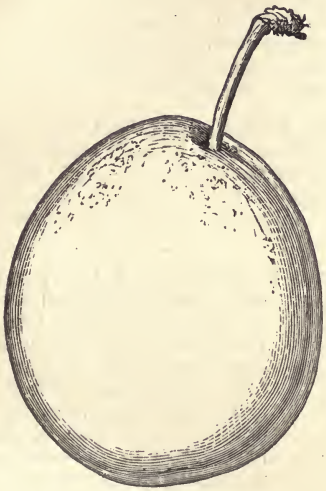

Fig. 392.—*Peters' Yellow Gage.*

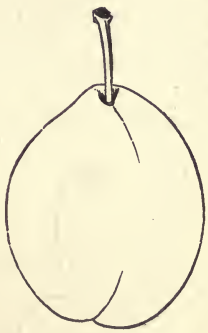

Fig. 393.—*Primordian.*

long, set in a deep cavity on one side of the plum; suture distinct, dividing the fruit unequally; flesh greenish yellow, rich, sweet, very good.

Précoce de Bergthold. Small, roundish-oval, yellow; juicy, sweet. Very early, middle of July.

Primordian. (Jaune Hâtive, or Early Yellow, White Primordian.) Small, obovate, necked; suture small; stalk slender, downy, half an inch long; pale clear yellow, bloom thin; flesh yellowish, moderately juicy, with a rather sweet, mild, good flavor; very free from the stone. Middle of July. Shoots quite slender, very downy, growth slow. Valuable only for its extreme earliness.

Reine Claude de Bavay. Round-oval, greenish yellow, spotted

with red, with small, violet-colored, longitudinal veins ; flesh rather firm, juicy, sugary, rich, of fine quality, adhering slightly to the stone. Shoots smooth, leaves roundish, shining—the growth resembling Washington, but leaves smaller and shoots slenderer. Very productive.

Schuyler Gage. Size medium, oval, suture moderate, yellow with green splashes, dotted and shaded with red next the sun ; stalk long, curved, slightly sunk ; flesh yellow, juicy, sweet, excellent. Resembling Green Gage—free from the stone. Last of September. Tree vigorous, productive. Albany, N. Y.

St. Catherine. Size medium, obovate, suture very distinct, passing half round ; skin pale yellow, sometimes slightly reddish to the sun, bloom thin, white ; stalk three-fourths of an inch long, very slender, slightly sunk ; flesh juicy, rather firm, rich, fine. Ripens rather late. Shoots smooth, rather slender.

ST. MARTIN'S QUETSCHE. Size medium, ovate, broadest at base ; surface pale yellow ; often spotted with brown ; bloom white ; flesh yellowish, very juicy, rich, excellent. Ripens at mid-autumn, and keeps long. Shoots smooth. A profuse bearer. One of the best late plums. Profitable. German. Too late for the far north.

WASHINGTON. (Bolmar, Bolmar's Washington.) Large, often very large, roundish-oval, suture obscure, distinct at base ; surface yellowish green faintly marbled, often with a pale red blush ; stalk one-half to three-fourths of an inch long, slightly downy ; cavity wide, shallow ; flesh rather firm, sweet, mild, moderately rich, free from the pointed stone. Rather early, last half of August. Shoots downy, very vigorous, leaves very large. Origin, New York city.

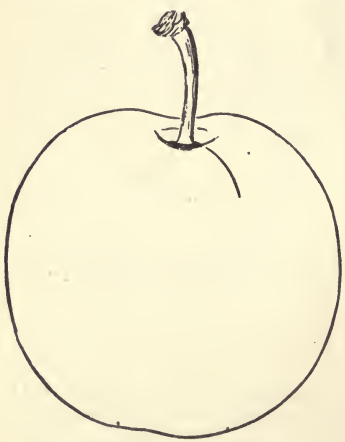

Fig. 394.—*Washington.*

White or Yellow Damson. (Late Yellow Damson.) Small (one inch long), oval, pale yellow, dotted with reddish brown ; stalk half an inch long, downy, not sunk ; flesh rich, sub-acid, agreeable ; ripens very late, hanging long on the tree. Shoots smooth, growth free. Tree very productive.

White Egg. (White Magnum Bonum, White Imperial.) Very

large, oval, narrow at ends, necked at base, suture distinct; stalk an inch long, not sunk, surrounded by a fleshy ring at insertion; skin light yellow, bloom thin, white; flesh firm, coarse, acid, becoming sweeter by ripening, adhering closely to the long, pointed stone. Ripens about the end of August. Culinary.

The Yellow Egg is very similar in character, but the flesh partly separates from the stone when fully ripe. There appear to be several sub-varieties.

T. Rivers, of Sawbridgeworth, England, says the Yellow Magnum Bonum is an American plum of extreme hardiness—good, but not first-rate—flesh clings—and bears more freely than "our old White Magnum Bonum."

Yellow Gage, English. (Little Queen Claude.) Small, round, suture on one side distinct; surface pale yellowish green, becoming yellow, with a few reddish dots, bloom dense; stalk half an

Fig. 395.—*White or Yellow Damson.*

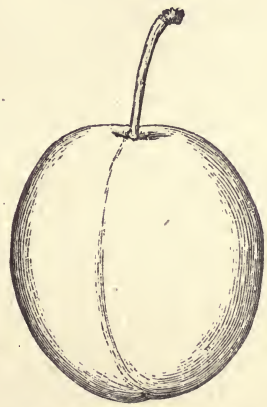

Fig. 396.—*Yellow Gage, Prince's.*

inch long, slender, slightly sunk; flesh very sweet, pleasant, quite free from the stone. Ripens nearly with the Green Gage. Shoots long, smooth. Of French origin.

YELLOW GAGE, PRINCE'S. (American Yellow Gage.) Size medium; oval, slightly broadest at base; suture a mere line; surface golden yellow, slightly clouded; bloom white, copious; stalk an inch long, cavity small, round; flesh deep yellow, rich, sugary, melting, sometimes rather dry. Ripens early in August. Shoots smooth, short-jointed, leaves glossy, tree becoming spreading. Origin, Flushing, L. I.

CHAPTER VII.

THE CHERRY.

Propagation. The cultivated varieties of the cherry consist of two distinct classes of sorts; the first comprising the Mazzards, Hearts, and Bigarreaus, is characterized usually by the tall, upright growth and pyramidal form of the tree, by the large, vigorous, and straight young branches, and by a sweet or bitter, but not a sour taste. The second class, or round-fruited, including the Dukes, Morelloes, and the common pie cherry, has small, irregular, and thickly growing branches, and a decidedly acid fruit. Observation will soon enable any one to distinguish these two classes, even where the trees are not more than a foot in height. It is the former only that are commonly used as stocks for grafting and budding, on account of their straight and rapid growth.*

The stones, as soon as they are taken from the fruit, should be dried only enough to prevent mouldiness, and then mixed with an equal quantity of clean moist sand. This will preserve a proper degree of moisture, and allow the easy separation of the stones in planting. The best way to keep them till spring, is to bury them in shallow pits on a dry spot of ground, covering them with flat stones and a few inches of earth.

The seed may be planted in autumn or spring. If in autumn, the ground should be dry, and entirely free from all danger of becoming flooded or water-soaked. Unless the soil is quite light, the surface

* Attempts are not unfrequently made to propagate the common cherry on the wild Black Cherry (*Cerasus virginiana*), or on the Choke Cherry (*C. serotina*). Such attempts prove to be failures, the sorts being too dissimilar in their natures to favor union. These two species, it will be observed, have racemose inflorescence, while in the cultivated cherry the flowers are simply in fascicles or umbels. Some of the wild species (as the Sand Cherry, *C. pubescens*), having the latter kind of inflorescence, have been successfully used as stocks, and their adoption might possibly prove useful at the South and West, where the Heart cherries fail.

should be covered with leaf mould or pulverized manure, to avoid the formation of a hard crust upon the surface, which would prevent the young plants from breaking through. But usually spring is the best season, if the planting is done the moment the frost is out of the ground; for the seeds sprout and grow on the first approach of warm weather. The distance should be the same as for the peach and apple; and nearly the same directions are applicable to their management in the nursery rows.

Good seedlings, averaging a foot and a half high, may be transplanted from the seed-beds when a year old, and if well cultivated in good soil, may be budded the same season. Where the buds fail, the trees may be grafted in the following spring.

Budding can only succeed with thrifty, freely growing stocks, and with well matured buds. About the time, or a little after the most vigorous stage of growth, or just as the terminal buds on the shoots *commence* forming, is the best period. If earlier, the buds will usually be too soft; if later, the bark will not peel freely, nor the buds adhere well. This period usually commences about midsummer, and continues, under the various influences of season and soil, for two or three weeks, and sometimes more than a month. Success will be found to depend also upon cutting out with the bud, a larger portion of the wood than is common with other budding, or equal to one-third the diameter of the shoot. This will be found particularly useful where the buds are slightly immature, retaining in them a larger portion of moisture, and preventing their curling off from the stock.

Difficulty is often experienced in successfully grafting the cherry. It succeeds well, if performed very early in the spring, before the slightest swelling of the buds, and before the frost has disappeared from the ground. After this period it is very liable to failure.

In propagating the slower-growing, sour-fruited varieties, good trees are often soonest obtained by grafting or budding them at standard height on large straight stocks. If grafted, they soon form a handsome head; if budded, care must be taken by judicious pruning to prevent the young shoots from growing all on one side.

Pruning the cherry, except to form the head, is rarely needed.

SOIL.

The cherry being a very hardy tree, will thrive in the Northern States in nearly all good soils. But a dryer soil than for most other species is found preferable; a sandy or gravelly loam is best.

In wet places, or on water-soaked sub-soils, it does not flourish, and soon perishes.

DWARF CHERRIES.

These are, as yet, cultivated to a limited extent in this country. They are chiefly adapted to village gardens, or other grounds of limited extent, as they may be set as near each other as five or six feet. They may be easily covered with netting, and thus protected from the birds; and what is most rare and desirable, the fruit permitted to remain until fully ripe, so important to the flavor of all cherries of an acid character.

The stocks used for this purpose are the Mahaleb (*Prunus Mahaleb*), which also possesses the advantage of flourishing on heavy clay ground. The buds usually grow quite vigorously, their branches being so pruned that seven, nine, or more, may come out from the centre of the plant, like a well managed gooseberry bush. These branches will put forth, early in summer, as in pyramidal pears, several shoots at their extremities, all of which must be pinched off to within two or three buds of their base, leaving the leading shoots untouched till near the close of summer, when they must be shortened to eight or ten buds. The Heart and Bigarreau cherries may be left of one-half greater length than the Dukes and Morelloes, which are of smaller habit of growth; and where the ground is small, the trees may be root-pruned and kept within a very limited space.

The cultivation of dwarf cherries would greatly facilitate the use of net screens for covering entire orchards, as sometimes practised in Holland and England. The boundary fence is made of wire (or wood) lattice, so as to exclude small birds. At regular distances, through the inclosed area, are inserted into the earth, wooden or tile sockets for the reception of poles or props to support the net. These poles have each a small circular board nailed on their tops, to prevent injury to the netting. The boundary fence is supplied with hooks, to which the net is readily attached. When the cherries begin to ripen, it is elevated on several of the poles, each carried by a man, and spread over the garden, the rest of the poles being easily inserted in their sockets afterwards. All birds are thus completely excluded. During rain or dewy evenings, the net is stretched to its utmost extent, as indicated by the dotted lines in the annexed figure. In dry weather it is slackened, and forms a festooned vault over the whole cherry garden. Its durability is increased by soak-

ing it in tan once a year. Ten square rods of ground, comprised within a circle of fifty-nine feet in diameter, would contain forty

Fig. 397.—*Birds excluded from miniature cherry orchard by net screen.*

dwarf cherry-trees at eight feet distance, or ninety trees at five feet distance.

Sometimes the cherry crop is much lessened by long and *heavy rains*, at the period of the bursting of the anthers, washing down the pollen, and preventing the fertilization of the stigma and germ.

At the South and West the finer varieties of the Heart and Bigarreau cherries do not flourish. This is supposed to be caused by the hot sun upon the bark of the trunk, and by rapid growth preventing a sufficient hardening of the wood. The Mayduke, Early Richmond, and the Morelloes generally succeed well. Grafting the Heart varieties upon these hardy sorts, has been found useful, and training the trees with low heads or with but little bare trunk, is an additional security. The cracking and bursting of the bark at the West is partly prevented by these precautions; but the safest way is to confine the culture of this fruit to the sorts above named, which are least affected.

SYNOPSIS OF ARRANGEMENT

Class I. Fruit heart-shaped.

(Fruit inclining to sweet, tree vigorous and regular in growth.)

Heart and Bigarreau Cherries.

Section I. Fruit black, dark red, or crimson.
Section II. Fruit bright red, or lighter.

Class II. Fruit round.

Duke and Morello Cherries.

Section I. Fruit black, dark red, or crimson.
Section II. Fruit bright red, or lighter.

Class I. Fruit heart-shaped.

Section I. Fruit black, dark red, or crimson.

Black Eagle. Rather large, obtuse heart-shaped, roundish, nearly black; stalk an inch and a half long, rather slender, slightly sunk; flesh dark, deep purplish crimson, with a very rich, high, excellent flavor. Season medium (1st of July). Shoots stout, diverging or spreading. A cross of the Graffion and Mayduke. English. Not always of the highest character. A moderate bearer.

Fig. 402. *May Bigarreau.* Fig. 401. *Knight's Early Black.*

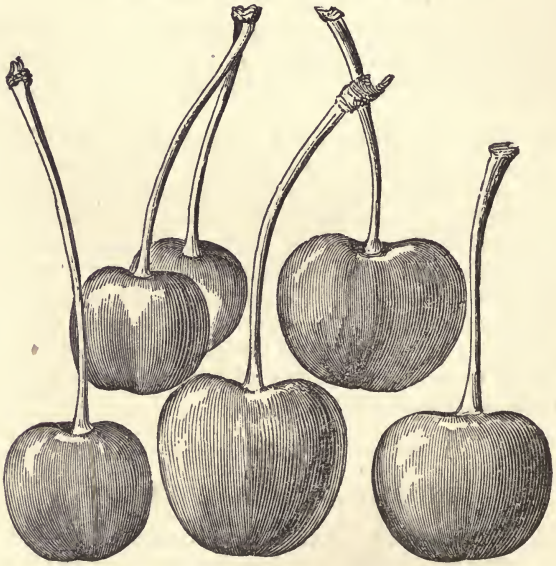

Fig. 400. *Early Purple Guigne.* Fig. 399. *Black Tartarian.* Fig. 398. *Black Eagle.*

Black Hawk. Large, heart-shaped, often obtuse, sides compressed, surface uneven; color purplish black, glossy; flesh dark purple, rather firm, rich, high flavored. Last week of June. Dr. Kirtland, Cleveland, Ohio.

Black Heart. Medium or rather large, heart-shaped, slightly irregular; blackish crimson, becoming black; stalk an inch and a half long, moderately sunk; tender when ripe, with a high, "very

good" flavor. Season medium, or rather early. Productive and hardy; growth rather erect, or with diverging shoots.

Davenport, or *Davenport's Early*, closely resembles Black Heart, but is a few days earlier, and the leaves are larger and lighter green.

BLACK TARTARIAN. (Frazer's Black Tartarian, Black Circassian, Black Russian, Ronald's Large Black Heart, Ronald's Heart.) Quite large (often an inch in diameter), on crowded old trees only medium; heart-shaped, often rather obtuse, surface slightly uneven; nearly or quite black; stalk an inch and a half long, slightly sunk; flesh dark, half tender, with a peculiar liver-like consistency, rich, nearly destitute of acid, with a very fine, mild flavor. Ripens early, or about the middle of June. Shoots very erect. The vigorous growth and great productiveness of the tree, and the large size and mild sweet flavor of the fruit, render this variety a general favorite. Fig. 399.

Brandywine. Rather large, broad heart-shaped; crimson, mottled; flesh tender, slightly sub-acid, very good. Last of June. Origin, Wilmington, Del.

Brant. Large, heart-shaped; reddish black; flesh dark purplish red, sweet, half tender, juicy, rich. Middle of June. Cleveland, Ohio. Dr. Kirtland.

Conestoga. Large, obtuse heart-shaped; dark purple; stalk long, slender; flesh firm, with a rich, pleasant flavor. Lancaster co., Penn.

Cumberland's Seedling. (Triumph of Cumberland.) Large, obtuse heart-shaped; purplish crimson; flesh firm, very good. Middle of June. Carlisle, Penn.

EARLY PURPLE GUIGNE. Size medium, round heart-shaped, distinctly dotted when ripening; dark red, becoming nearly black; flesh dark, tender, juicy, rich, sweet. Growth less vigorous than most heart cherries, shoots dark brown, spreading; leaves rather small, drooping on long petioles. Very early, ripening first ten days in June. Fig. 400.

Elkhorn. (Tradescant's Black Heart, Large Black Bigarreau.) Large, heart-shaped, surface slightly uneven; black; stalk rather short, or an inch and a fourth long, cavity rather deep; flesh solid, firm, not juicy, with a high, fine flavor, bitter before fully ripe. Rather late. Shoots dark grey.

Jocosot. Large, regular, heart-shaped, indented at apex; glossy, nearly black; flesh tender, with a sweet, rich flavor. Last of June. Ohio.

Kennicot. Large, oval heart-shaped; amber-yellow, mottled and

shaded with bright red; flesh firm, rich, sweet. Early in July. Cleveland, Ohio.

KNIGHT'S EARLY BLACK. Large, obtuse heart-shaped, surface slightly uneven; black; stalk an inch and a fourth or an inch and a half long, rather stout, cavity deep, narrow; flesh dark purplish crimson, tender, juicy, with a very rich, high, excellent flavor. Ripens nearly with the Black Tartarian. Shoots diverging or spreading. Much resembles the Black Eagle, but larger, earlier, more heart-shaped, and with *a much deeper cavity*. English. In some localities it appears to need a rich soil and warm situation to develop its excellence. A moderate and sometimes poor bearer. Fig. 401.

Leather Stocking. Medium, heart-shaped; reddish black; flesh firm, sweet. Last half of July. Cleveland, Ohio.

Logan. Rather large, obtuse heart-shaped, indented at apex; purplish black; flesh rather firm, sweet, rich. Last half of June. Cleveland, Ohio.

Manning's Late Black. Large, roundish; deep purple or black; flesh purplish, half tender, sweet, excellent. End of June. Salem, Mass.

May Bigarreau. (Baumann's May of Downing, Bigarreau de Mai.) Rather small, oval heart-shaped, becoming as it ripens nearly round; color deep red, becoming black; stalk an inch and three-fourths long, rather stout at the ends, cavity narrow; flesh dark crimson, juicy, rather sweet, not high flavored. Very early, or first ten days of June. Productive. Shoots diverging, brown, resembling in color those of the Mayduke. Fig. 402.

MEZEL. (Great Bigarreau, Great Bigarreau of Mezel.) Large, obtuse heart-shaped; surface uneven, dark red, becoming black; stalk long, slender; flesh rather firm, rich, very good. First of July. Shoots slightly flexuous; tree great bearer.

Osceola. Rather large, heart-shaped; dark red, nearly black; flesh tender, sweet, very good. End of June. Cleveland, Ohio. Dr. Kirtland.

Pontiac. Large, roundish heart-shaped; dark red, becoming nearly black; flesh half tender, sweet, and agreeable. Cleveland, Ohio. Dr. Kirtland.

Powhatan. Size medium, roundish; dark purple, glossy; flesh purplish red, half tender, with a pleasant flavor. End of July. Cleveland, Ohio.

Richardson. Large, heart-shaped; blackish red; flesh deep red, half tender, sweet. Last of June. Mass.

Tecumseh. Rather large, obtuse heart-shaped; reddish purple;

flesh dark red, half tender, with a rich sub-acid flavor. End of July. Cleveland, Ohio.

Wendell's Mottled Bigarreau. Medium or rather large, obtuse heart-shaped; dark red, becoming nearly black, mottled with dark streaks or points; suture a dark line on one side; stalk medium; cavity round, irregular; flesh firm, crisp, high flavored; stone small. Rather late. Growth upright. Albany, N. Y.

Werder's Early Black Heart. Large, roundish heart-shaped; skin black; flesh purplish, tender, very good. First half of June.

Section II. Bright red or lighter.

American Heart. Medium or rather large, four-sided heart-shaped; color light red or pink, mixed with amber; stalk nearly two inches long, slender, cavity small and shallow; flesh half tender, adhering to the rather tough skin, juicy, sweet, good. Very productive. Early.

Belle d'Orleans. Rather large, roundish heart-shaped; light yellow, with pale red; flesh tender, with a sweet, excellent flavor. Middle of June. Tree a good grower. Productive. A valuable early sort.

Burr's Seedling. Rather large, distinct heart-shaped, smooth; a fine deep clear red, often spotted or marbled; stem an inch and a half long, cavity moderate; flesh half tender (about as firm as American Heart, from which it probably originated), sweet, rich, with a fine flavor. Growth vigorous, very productive. Season medium. Origin, Perrinton, N. Y.

Carmine Stripe. Rather large, heart-shaped; a carmine line on the suture, amber yellow with bright carmine; flesh tender, agreeable. Last of June. Ohio.

Caroline. Rather large, roundish oblong; pale amber mottled with red; tender, sweet, delicate. Last of June. Cleveland, Ohio.

Champagne. Medium, roundish heart-shaped; reddish pink; stalk medium, cavity shallow; flesh amber colored, sub-acid, rich. Last of June. Raised by C. Downing, Newburgh, N. Y.

China Bigarreau. Medium in size, oval heart-shaped, somewhat roundish, suture distinct; color amber mottled with red, becoming red; stalk long, slender, cavity shallow; flesh half tender when ripe, with a rather rich and peculiar second-rate flavor. Season rather late. Shoots spreading. Origin, Flushing, L. I.

Cleveland. (Cleveland Bigarreau.) Large, round heart-shaped, suture broad and deep half way round; color bright, clear, delicate red on amber yellow; stalk an inch and a half long, curved

flesh firm, juicy, sweet, very rich. Season early, or with Black Tartarian. Origin, Cleveland, Ohio.

COE'S TRANSPARENT. Size medium, nearly globular, very regular; skin thin, pale amber, reddened in the sun, with peculiar pale spots or blotches; stalk nearly an inch and a half long, moderately sunk; very tender, melting, sweet, excellent. Early, just before Black Tartarian. Growth thrifty. Origin, Middletown, Conn. One of the most valuable of all cherries.

Fig. 403.
Coe's Transparent.

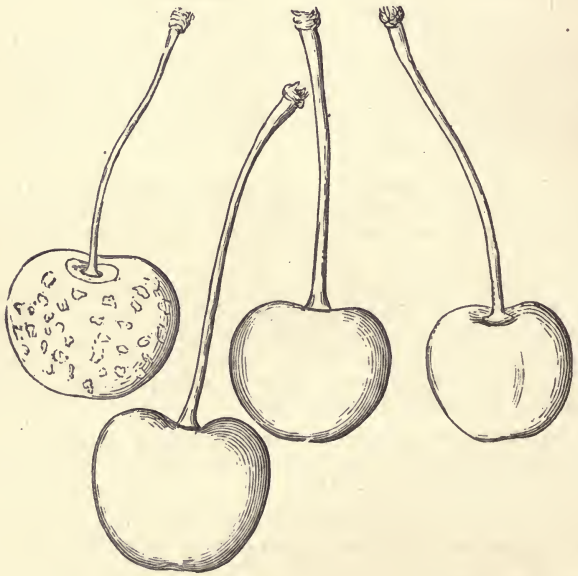

Fig. 405. *Downton.* Fig. 404. *Downer's Late.* Fig. 406. *Early White Heart.*

Delicate. Rather large, roundish oblate; stalk medium in length, cavity rather large; color yellow, mottled and shaded with carmine, translucent; flesh light yellow, flavor excellent. 1st of July. Tree spreading, forming a round head. Cleveland, Ohio.

Doctor. Size medium, round heart-shaped; color light yellow and red, blended and mottled; stalk an inch and a half long; cavity round, regular; flesh white, tender, juicy, sweet, fine. Very early. Resembles American Heart, but two weeks earlier

Growth moderate, spreading, leaves narrow. Origin, Cleveland, Ohio.

DOWNER. (Downer's Late, Downer's Late Red.) Size medium, round heart-shaped, smooth; red, light amber in the shade; stalk an inch and a half long, slightly sunk; fruit in clusters; flesh tender, melting, rich, very high flavored—not good till fully ripe. Rather late. Growth erect. Hangs late, and does not rot easily. Origin, Dorchester, Mass. Fig. 404.

Downing's Red Cheek. Size medium or rather large, obtuse heart-shaped, regular, suture distinct; color with a broad crimson cheek; stalk an inch and a half long, cavity of medium size; flesh half tender, delicate, sweet, rich, very good. Rather early. Origin, Newburgh, N. Y.

DOWNTON. Large, round heart-shaped, apex quite obtuse, or slightly indented; light cream color, stained with red; stalk an inch and three-fourths or two inches long, slender; cavity wide; flesh yellowish, tender, adhering slightly to the stone, rich, delicious. Season medium or rather late. Growth rather spreading. Fig. 405.

Early Prolific. Medium, roundish heart-shaped; color bright red on yellow ground; stalk long; flesh half tender, very good. Early. Cleveland, Ohio.

Early White Heart. Medium, or rather small, heart-shaped, slightly oblong, often a little one-sided, suture distinct; color dull whitish yellow, tinged and spotted with pale red; stalk an inch and three-fourths long, cavity wide, shallow; flesh rather firm, tender when ripe, sweet, pleasant. Quite early. Growth erect. An old sort, now becoming superseded. Fig. 406.

Elliott's Favorite. Size medium, round, regular, slightly compressed; color pale amber yellow, with a bright, marbled, carmine-red cheek; stalk an inch and a half long, cavity even and regular; flesh pale amber, translucent, tender, delicate, juicy, with a sweet, fine flavor. Season medium, ripening with Belle de Choisy. Shoots vigorous, diverging. Origin, Cleveland, Ohio.

ELTON. (Flesh-Colored Bigarreau.) Large, pointed heart-shaped, somewhat oblong; pale yellow, blotched and shaded with red; stalk two inches long, slender; flesh firm, becoming rather tender, rich, high flavored, "very good." Season medium or rather early. Growth spreading, rather bending, petioles reddish purple. A cross between the Graffion and White Heart. English. Rather tender in very severe climates. Fig. 407.

Florence. (Knevett's Late.) Large, heart-shaped, regular, smooth; amber yellow marbled with red, and with a red cheek; stalk an inch and a half long; flesh firm, juicy, sweet; season rather late.

Resembles Yellow Spanish, but hardly so large, and ten days later. Fig. 408.

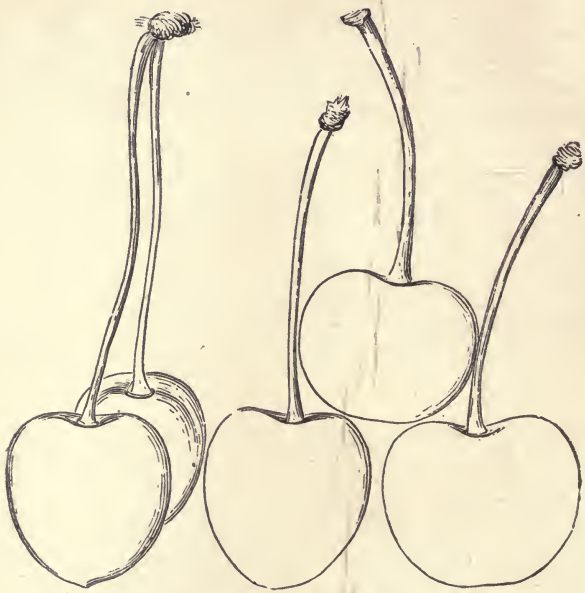

Fig. 407. *Elton.* Fig. 409 *a*. *Holland Bigarreau.* Fig. 408. *Florence.* Fig 411. *Bigarreau or Yellow Spanish.*

Governor Wood. Large, roundish heart-shaped; light yellow shaded and marbled with light red; stalk an inch and a half long, cavity wide; rather tender, nearly sweet, rich, excellent. Middle of June. Tree vigorous, shoots diverging, forming a round head. Cleveland, Ohio. As the trees grow older, they often overbear and yield a smaller and less excellent fruit—hence requiring thinning.

Hoadley. Rather large, roundish heart-shaped; light clear red on pale yellow; flesh tender, rich, sweet, excellent. Last week of June. Origin, Cleveland, Ohio.

Hovey. Large, obtuse heart-shaped; amber, with a fine red cheek; stalk an inch long, deeply set; flesh rather firm, pale amber, "very good." Last half of July. Boston, Mass.

Hyde's Late Black. Medium, obtuse heart-shaped; purplish black; flesh half firm. First week in July. Newton, Mass.

KIRTLAND'S MARY. Quite large, round heart-shaped, regular, base somewhat flattened; color light and dark red, deeply marbled on a yellow ground; stalk an inch and a fourth to an inch and a half long; flesh light yellow, half tender, rich, juicy, sweet, high flavored. Season medium, or with the Elton. Origin, Cleveland, Ohio.

Kirtland's Mammoth. Very large, obtuse heart-shaped; rich red on bright, clear yellow; flesh rather tender, with a fine, high flavor. A moderate bearer. End of June. Cleveland, Ohio.

Manning's Mottled. (Mottled Bigarreau.) Medium or rather large, round heart-shaped, suture distinct; color amber, shaded and mottled with red; semi-transparent, glossy; stalk slender, cavity shallow; flesh yellow, tender when ripe, sweet, good. Stone rather large. Season, end of June. Shoots dark. Productive. Origin, Salem, Mass.

NAPOLEON BIGARREAU. Very large, regularly heart-shaped, remotely oblong; skin pale yellow and amber, spotted and shaded with deep red; stalk an inch and a fourth long; flesh very firm, with a fine but hardly first-rate flavor. Rather late. Shoots with a light greenish cast. Growth rather erect, vigorous. Very productive, and good for market, but too firm and deficient in flavor

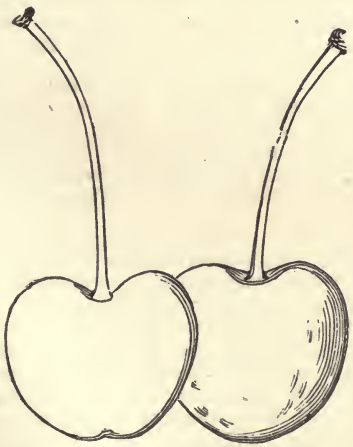

Fig. 409. *Rockport Bigarreau.* Fig. 410. *Napoleon Bigarreau.*

for the small garden. The *Holland Bigarreau* closely resembles the above, and is thought by some to be identical.

Ohio Beauty. Very large, oblate heart-shaped; dark red on a pale red ground, somewhat marbled, very handsome; stalk an inch and a half long, rather stout, cavity wide and deep; flesh white, tender, juicy, with a fine flavor. Early, or about ten days before Napoleon Bigarreau, which it equals in size. Origin, Cleveland, Ohio.

Red Jacket. Large, obtuse heart-shaped; color light red; flesh half tender, with a good sub-acid flavor. Ripens with Downer. Keeps well without rotting. Cleveland, Ohio.

Rockport Bigarreau. Quite large, round heart-shaped; color, when fully ripe, a beautiful clear red, shaded with pale amber, with occasional spots; stalk an inch and a half long, cavity wide; flesh firm, juicy, sweet, rich, with an excellent flavor. Season rather early. Tree upright, vigorous. Origin, Cleveland, Ohio; one of the best of Dr. Kirtland's seedlings. Fig. 409.

Sweet Montmorency. Medium in size, round, slightly flattened at base, with a depressed point at apex; color pale amber, mottled with light red; stalk an inch and three-fourths long, slender, cavity small, even; flesh yellowish, tender, sweet, excellent. Season very late or past midsummer. Approaches somewhat in character the Morello. Origin, Salem, Mass.

Townsend. Large, obtuse heart-shaped, high-shouldered, suture distinct; light amber with red; flesh rather tender, with a rich, pleasant flavor. End of June. Lockport, N. Y.

White Bigarreau. (Large White Bigarreau, White Ox-Heart.) Large, heart-shaped, tapering to obtuse apex, suture distinct; surface slightly wavy, yellowish white marbled with red; flesh moderately firm, or half tender, very rich and delicate. Season medium. A moderate bearer when young, more productive afterwards; liable to crack after rain. Tree rather tender; growth spreading.

Yellow Spanish. (Bigarreau, Graffion.) Very large, often an inch in diameter, obtuse heart-shaped, very smooth, regular, base flattened; surface clear, pale waxen yellow, with a handsome light red cheek to the sun; stalk an inch and three fourths long, cavity very wide, shallow; flesh firm, with a fine, rich flavor. Season medium, or last of June. Shoots stout, diverging or spreading. The *Late Bigarreau*, originated with Dr. Kirtland, of Cleveland, resembles this, but is slightly less in size, deeper red, and ripens about ten days later. Fig. 411.

Class II.—Dukes and Morelloes.

Section I. Fruit black, dark red, or crimson.

Arch Duke. (Portugal Duke, Late Arch Duke.) Very large, round heart-shaped, slightly flattened, dark shining red, becoming nearly black; stalk an inch and a half long, slender, deep sunk; flesh light red, when matured rich sub-acid, slightly bitter till fully ripe, of fine flavor, hardly equal in quality to Mayduke. Season very late, or just before midsummer. One-fourth larger than Mayduke, and tree more spreading, and with thicker and darker foliage. Rare.

Donna Maria. Size medium, dark red; rich, acid. Late. Succeeds well at the West.

Late Duke. Large, obtuse roundish heart-shaped, slightly oblate; color light, mottled with bright red at first, becoming rich dark red when ripe; stalk an inch and a half long, rather slender, cavity shallow; flesh pale amber, sub-acid, not rich, much less so than Mayduke; season very late, or a little after midsummer. Tree more spreading than Mayduke, and foliage rather more compact, approaching somewhat the character of a Morello.

Louis Philippe. Size medium, roundish; dark red; flesh red, acid, tender. Middle of July. French. Succeeds well at the West.

Mayduke. Large, roundish, obtuse heart-shaped; color red at first, becoming when mature nearly black; flesh reddish, becoming dark purple, very juicy and melting, rich, acid, excellent. It is frequently picked when red, immature, and not fully grown, and imperfect in flavor. Quite early—but often varying greatly and permanently in its season of ripening, even on the same tree. Holman's Duke and Late Mayduke are only late variations perpetuated by grafting. Growth upright for a Duke. Very hardy, and adapted to all localities.

Morello. (English Morello, Large Morello, Dutch Morello, Ronald's Large Morello.) Rather large, approaching medium; round, obscurely heart-shaped; dark red, becoming nearly black; flesh dark purplish crimson, of a rich acid, mixed with a slight astringency. Season very late, or after midsummer. In England, its ripening is retarded till autumn by the shading of a wall. The common Morello is a smaller sub-variety, a little darker and with smaller branches.

Royal Duke. (Royal Tardive.) Very large, roundish, distinctly oblate; surface dark red; flesh reddish, tender, juicy, rich; season rather late. Growth like the Mayduke. Rare.

Shannon. Medium, round, flattened at base; dark purplish red; stalk long, slender, open; flesh reddish purple, rather acid. Middle of July. Cleveland, Ohio.

Section II. Fruit bright red or lighter.

Fig. 412.—*Belle de Choisy.* Fig. 413.—*Belle Magnifique.*

BELLE DE CHOISY. Size medium, round, very even, obscurely oblate; skin thin, translucent, showing the netted texture of the flesh; stalk rather short, slender; flesh pale amber, mottled with yellowish red, becoming in the sun a fine cornelian red; skin very tender, with a fine, mild, sub-acid flavor, becoming nearly sweet; season rather early. Moderately productive; needs good cultivation. French.

BELLE MAGNIFIQUE. Quite large, roundish, inclining to heart-shaped; color a fine rich red, portions of the surface often a lighter hue; stalk slender, nearly two inches long, cavity large; flavor rather mild for this class, fine, but not of the highest quality. One of the best late varieties, ripening about midsummer. Productive. Growth resembles that of the Mayduke in form. French.

Belle de Sceaux. Size nearly medium, roundish; red; stalk moderate; flesh rather acid—the tree and fruit somewhat resembling Early Richmond, but later.

Carnation. Large, round, yellowish white, mottled and marbled with fine orange red; stalk an inch and a fourth long, stout; flesh slightly firmer than most of this class, a little bitter at first, becoming mild acid, and with a rich, fine flavor. Growth spreading, leaves resembling those of a heart cherry. Very late, ripening about midsummer.

Prince's Duke is a large sub-variety, but a very poor bearer and of little value.

Coe's Late Carnation. Rather large, medium; color amber and bright red; sub-acid, sprightly. Last half of July.

Duchesse de Palluau. Size medium, roundish heart-shaped; dark purple; stalk long, slender, cavity large; flesh dark red, mild, acid. Middle of June.

Early May. (Cerise Indulle.) Small, round, approaching oblate, bright high red; stalk an inch long; flesh juicy, acid, good Very early. Tree dwarfish. Of little value.

EARLY RICHMOND. (Virginian May, Kentish, Kentish Red, English Pie Cherry.) Rather small, becoming medium when well ripened, round, slightly oblate, growing in pairs; color a full red; stalk an inch or an inch and a fourth long, rather stout; flesh very juicy, acid, moderately rich. Stone adhering strongly to the stalk, often withdrawing it from the fruit when picked. Very productive; fine for early cooking, ripens early and hangs long on the tree. Of great value at the West.

Jeffrey's Duke. (Jeffrey's Royal, Royale.) Size medium, round, obscurely oblate; color a fine lively red; stalk medium; flesh amber with a tinge of red, rich, juicy, of fine flavor. Growth slow, very compact, fruit in thick clusters; season medium. Resembles Mayduke, but smaller, rounder, and lighter colored. Rare in this country.

Large Morello. (Kirtland's Large Morello.) Rather large, roundish; dark red, with a good, rich, sub-acid flavor. Early, July. Cleveland, Ohio.

Pie Cherry (American.) (Late Kentish of Downing, Common Red, American Kentish.) Size medium, approaching small, roundish, slightly oblate; stalk an inch to an inch and a half long, stout; color light red; flesh very juicy, quite acid, moderately rich. Rather late. Stone not adhering to the stalk, as with the preceding. Very productive; a good culinary sort.

PLUMSTONE MORELLO. Large, roundish heart-shaped; color deep red; stalk an inch and a half long, slender, straight; cavity moderate; flesh reddish, of a rich acid flavor. Very late, or after midsummer. Stone rather long and pointed.

REINE HORTENSE. Quite large, roundish oblong; bright red, slightly marbled and mottled; suture a mere line; sub-acid, rich, excellent. Last half of July. Tree a handsome, good grower, a moderate bearer. French.

Vail's August Duke. Large, obtuse heart-shaped; bright red; stalk medium; sub-acid, with a Mayduke flavor. 1st of August. Vigorous and productive. Troy, N. Y.

CHAPTER VIII.

THE GRAPE.

THERE is no doubt that by the next twenty years the Grape will stand second only in importance to the apple. This opinion refers to its uses as a fresh fruit only, and not to its manufacture into wine.

New varieties of American hardy grapes are yearly springing into existence, that possess considerable promise of permanent value and excellence; and by the lapse of another score of years, we shall, unquestionably, have a series that will give us good fresh fruit from a period soon after midsummer till the succeeding spring. We already obtain in the Northern States, fresh grapes from the end of summer to the latter part of winter, by means of the following varieties:—Hartford Prolific, Delaware, Creveling, Concord, Diana, Rebecca, Isabella, and others. The best keepers appear to be the Diana, Rebecca, and Isabella—to which may perhaps be added the Clinton, a variety not good enough to eat under ordinary circumstances, but which, if well ripened and kept till after mid-winter, has its sharpness so softened as to become not only pleasant, but sought for its rareness at that season of the year. The Diana is remarkable for its freshness after several months' keeping.

To the preceding list we shall be able, probably, to add the Adirondac for its extreme earliness, preceding the Hartford Prolific, superior to it in quality, although requiring winter covering at the North. The Israella also gives high promise of early value. The Concord, possessing the several characteristics of great hardiness, productiveness, freedom from disease, and showy appearance, yet not of very high quality, may be partly displaced by the Iona and some of the black varieties of Rogers' Hybrids, although neither of these new sorts has been sufficiently tried in different localities to insure it a permanent position.

There are now a large number of new grapes, raised both by cross-fertilization and otherwise, that promise to extend the period

of ripe grapes longer than at present. That period is now exceeded, among all our kinds of fruit, only by the apple and pear. The apple now fills the whole yearly circle—"it belts the year." The pear continues to ripen from midsummer until the following spring, but there are few sorts that keep well after January; while grapes may be kept almost as easily as winter apples, although in a different way. The peach, in the North, continues to ripen scarcely two months at furthest—the plum about the same—while neither will keep long in a fresh state. The hardy grape will yet give us a delicious fruit remarkable for its wholesomeness, in unlimited quantity if we desire it, scarcely if ever failing with seasons—not less than eight out of the twelve months of the year.

PROPAGATION. The vine is propagated by *seeds*, *layers*, *cuttings*, and by *grafting*.

Seeds are planted only for obtaining new varieties, by cross-fertilization, as described in an early chapter of this work.

PROPAGATION OF THE GRAPE.

The facility with which the grape emits roots on its young stems, and the rapidity of its growth, render it one of the most easily propagated of all bearers of fruit. The new shoots, buried before midsummer, with a few inches of permanently moist earth, do not fail to throw out plenty of young fibres from every buried joint the first season. Cuttings and single bud under favorable circumstances, will root with equal certainty.

LAYERS—*Summer Layering.* Layering is the easiest and most certain, but not the most rapid mode of propagating the grape. It may be done on a small scale, for amateur purposes, without any special preparation, by using accidental or straggling shoots, or those purposely left near the foot of the vine. Usually a little before midsummer these shoots will have hardened sufficiently to prevent the rotting which might occur if buried too soft or green. Extend the shoot on the ground in order to determine the most convenient spot for excavating under the centre. Then make a small hole or depression with the spade, bend a shoot into this hole and cover it with a few inches of earth as shown in the following figure (Fig. 414). The surface of the ground must then be kept clean and mellow for the purpose of preserving moisture in the soil; and should the season be a very dry one, the surface should be mulched—that is, covered with a few inches of fine grass or short straw. If the shoot is a strong and thrifty one, and grows well at its extremity out of ground,

every joint will emit a profusion of roots, before the end of autumn presenting the appearance shown in Fig. 414. The layer may then be taken up by cutting it loose from the vine and shortening-back its extremity, and then by setting a spade far under it, lifting the whole out of the ground. It is then cut in two and forms two strong plants as shown in Fig. 415. These layers may be then heeled in or covered with earth for the winter, giving some protection from

Fig. 414.—*Grape Layer, the roots formed.*

Fig. 415.—*Grape Layer, separated into two plants.*

freezing by covering the surface with manure or leaves, or they may be packed for the winter in boxes of damp moss in the cellar.

Spring Layering. As layers, like unmolested runners on the strawberry, exhaust the main plant, they should be taken very sparingly from bearing vines. When they are required in large numbers, vines should be planted specially for this purpose—the soil to be made very rich and well cultivated, so as to produce a strong growth of shoots—unlike the moderate fertility required for bearing crops. The spaces between these vines should be six or seven feet; and generally two or three years are required, in connexion with cutting-back to two or three buds, and training one or two shoots to upright stakes, before the canes become strong enough to layer profitably. When this is the case, begin the work late in spring, about the time the buds open, by laying down the strongest cane of the two into a smooth straight trench made for the purpose, about five inches deep. The cane selected should not be less than eight or ten feet long, but so much of the end should be cut off as to leave only strong buds, the remaining part not being more than six or seven feet long. With short-jointed varieties it should be less in length. It is held in this position by pegs or stones. The object being to obtain a strong shoot at each eye, the end should not be bent up, which would draw the growth off in that direction. As soon as the new shoots have grown a few inches, the prostrate vines should be slightly covered with earth, which is to be increased as the growth advances

A more perfect way is to sprinkle a little compost along the cane and then fill the trench a few inches with loose damp moss. This will preserve a proper humidity and afford sufficient light to the starting shoots. After they have become well hardened the moss is removed and mellow soil substituted. The earth, if applied too early, might induce rotting in the young stems. Fig. 416 represents the appear-

Fig. 416.—*Shoots springing from a layered stem.*

ance of this process after the shoots have attained full growth and rooted well at the bottom. Usually about half-a-dozen plants are a sufficient number to raise from one cane; more will start, but they should be rubbed off to give strength to the remainder. When a part outgrow the others, they should be pinched back to equalize the growth. This process is repeated for successive years; but as it tends to exhaust the main plant it is advisable to suspend it occasionally for a year if the vigor becomes diminished.

These new plants are well rooted before winter; and should be taken up, separated, and packed away as already described. Fig. 417 represents one of these new plants.

It will be observed that while these plants were forming from the layered cane, one, two, or three shoots, according to the strength of the plant, should be trained to a stake for next season's work, the cane having been properly cut-back for this purpose.

Fig. 417.—*Newly formed layer-plant.*

Cuttings in Open Ground. This is sometimes an easy mode of raising plants, but is generally uncertain and often unsuccessful. Much depends on the character of the

soil for retaining moisture, and still more on the humidity of the air, which varies in different localities and with seasons. A rich, moderately compact, deep, and mellow soil, is required. It is especially important that it possess fertility in order to give the young plants a strong impetus the moment new roots are emitted. Shoots of one season's growth are selected, of full medium size, omitting small or unripe portions. Where the winters are severe, this wood should be cut off late in autumn, shortened to convenient lengths, and packed in slightly moist earth, or what is better, in damp moss, in boxes placed in a cellar. Sometimes the cuttings are placed in a bed in autumn, which answers well in mild climates, or where they are well protected during winter, with a thick layer of straw, manure, or leaves.

Fig. 418. *Grape Cutting.*

The cuttings are usually made about seven or eight inches long, and each one should have two or more buds. It should be pared away by a sharp knife immediately below the lower bud and about an inch above the upper one, as shown in Fig. 418. A trench (Fig. 419) is made with the spade next to a line, nearly perpendicular on one side and sloping on the other. The cuttings are placed upright against the steep side, about three inches apart, so that the upper bud shall be about an inch below the level surface. Fill the trench to the upper bud by adding successive portions, pressing each firmly with the foot, but leaving the soil more loose and mellow above. After the shoots have grown a few inches the surface may be levelled by burying the upper bud an inch beneath it. Some cultivators are more successful by covering the surface with an inch or two of fine manure for the retention of moisture in the soil. Roots will be emitted from both buds, and handsomer plants will be formed by cutting off the lower part, leaving the roots of the upper bud only to remain.

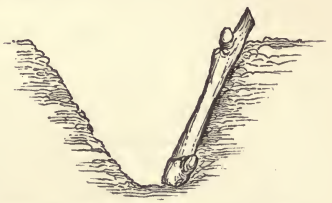

Fig. 419.—*Mode of planting Cuttings.*

Propagation from Single Buds. The various modes of propagating the vine from single buds, admit the rapid multiplying of numbers required for work on a large scale; but artificial heat is always necessary, either on a small scale in hot-beds, or more extensively in propagating houses.

Good, strong, well ripened wood of one year's growth must be cut in autumn, and secured for winter as already described. The work of forming or planting the buds or eyes is usually done in March; and being inserted through the month by successive portions, the work of repotting and afterwards setting out into open ground, may be also performed successively without crowding all the work into one period. It should not be done much later than early in April, when warm weather without may prevent the operator from giving the low temperature to the house, required for the leaves and shoots during the early stages of growth.

The operation should be commenced by trimming the wood which holds the eyes into proper form—throwing them into water to prevent drying, until enough are prepared for setting in the beds or pots. Different modes or forms are adopted for these cuttings. One of the best for general practice is represented in Fig. 420, the

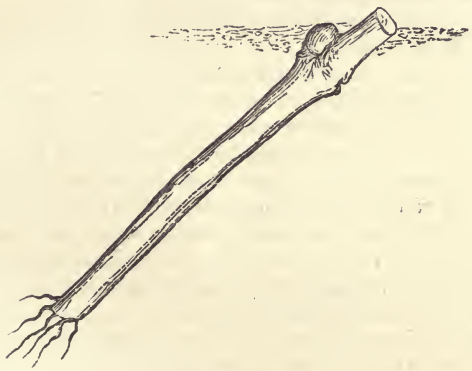

Fig. 420.

cut being about two and a half inches long, with the bud at the upper end about a fourth of an inch from the top.

When hot-beds are employed in giving bottom heat, the cuttings are usually placed in pots; but in the more common practice of employing propagating houses, they may be placed either in pots, shallow boxes, which have been well soaked in lime-wash some months before to prevent the formation of mould or fungus, or directly in beds about three inches deep over the hot water tanks in the house. The best material for receiving the buds is clean, pure building or lake sand, which is to be kept at all times at a uniform

degree of moisture, but never *wet.* It is the practice with some to place a stratum of prepared soil (hereafter described) an inch beneath the wood for the reception of the new roots, and sustaining the young plants for a longer time than sand alone—thus obviating so early a removal into pots as would otherwise be required. Each bud or eye need not occupy more than two square inches of surface. When properly imbedded in the sand, a moderate heat should be at first applied, not higher than fifty degrees—the object being to commence roots before sufficient warmth is given to expand the leaves. For this purpose also, the temperature of the air in the house, should be kept at all times at least ten degrees lower than that of the sand. In a few days from the commencement, the heat may be gradually raised, and as the leaves expand, it may be cautiously increased to eighty and ninety degrees. It is of great importance to avoid the checks given by sudden changes, from cold currents of air, cold water, or remitting fire.

When the roots have reached three or four inches in length, the plants should be potted off into a soil prepared for this purpose, by mixing about equal parts of clean sand and rich, rotten turf, or leaf mould in the place of turf. This mixture should be prepared several months beforehand, and be thoroughly pulverized and the parts mixed together; and unless the turf is quite rich, the addition of about one-fourth of rotten manure would be advisable. About a thirtieth part of wood ashes improves the mixture. Plenty of water should be given until the plants become established in their new home. When the roots reach the exterior of these pots they may be either transferred to larger ones or to the open ground—which completes the process for the first season.

Green Cuttings. Propagating by cuttings of unripe wood is practised, when it is desired to increase new sorts rapidly, in connexion with common propagation by single eyes. As they do not always mature well, or make strong vines the same season, they are objected to by many propagators. Occasionally, however, good strong vines may be obtained. They are made by taking strong shoots in summer, and making them into cuttings with one eye at the top, leaving on the leaf. These are inserted into sand (or the same kind of soil used for single eyes), as far down as the bud, the leaf resting on the surface. When small numbers are propagated, pots are used and moisture retained in the leaves by placing them under a glass frame in the propagating house, where the proper degree of moisture is maintained without the excess which would cause rotting. On a larger scale the cuttings are placed in the bor

ders of the propagating house, the leaves forming one continuous green surface. These are kept constantly moist by watering them from the watering pot, three or four times a day. In about three weeks they will be fit to remove to pots, and are then to be treated like other plants. They generally succeed best by being kept in the house during the remainder of the season, the wood ripening better and the vines becoming hardier, than if planted out in open ground, where there is not sufficient warmth to mature and harden the green wood.

ROOT GRAFTING. This mode has also been extensively adopted for propagating on a large scale. It is done by taking a portion of the shoot with one bud, as shown in the annexed figure (Fig. 421), and inserting a piece of root cut wedge-form into a cleft in the lower end of the cutting. Grafting plasters bind the parts together, but they are left open below for the emission of roots. Varieties which furnish long, smooth roots, are most convenient, of which the Concord is one of the best. The grafts are placed in shallow boxes of a convenient size, or about one by two feet, and three inches deep, and bottom heat given as before described, but less care is required in controlling the temperature.

Fig. 421
Root Graft.

GRAFTING IN OPEN GROUND. Large vines and vineyards of undesirable sorts, are sometimes changed to better, by grafting. It is uncertain of success, at best; although the grafts, when they do not fail to grow, push with great vigor, and frequently extend twenty feet or more in a single season. There are three different modes; one is to graft early in spring down into the root; the second is to defer the work until the buds swell and bleeding ceases, preserving the grafts in a dormant state in a cool place. The third, and generally the most successful, is grafting in autumn, according to the mode described in Fuller's Grape Culturist. A cleft graft is made at or near the surface of the earth, and the parts firmly bound together. An inverted pot is then placed over it and banked with earth, except the top, which is covered with six inches of straw, and the whole then buried in earth. This is removed in spring. Grafting in the open air appears to be so easily influenced by so many external causes, as frequently to result in entire failure, even in the most skilful hands.

TRAINING.

Young plants should be trained to a single strong shoot, like that represented in Fig. 422, for which purpose a stake should be used and the vine tied up as it advances. Spring plants set out early, will often reach a height of six or eight feet by the end of the season.

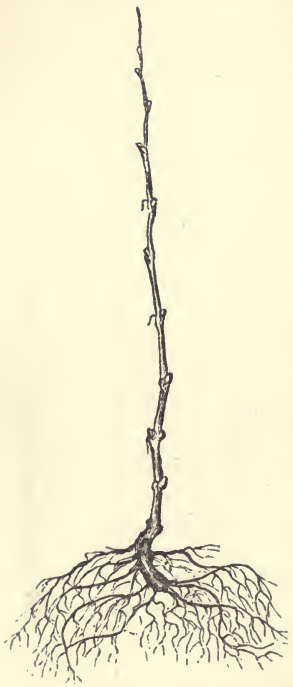

Fig. 422.—*One year plant.*

Cuttings of the first year's growth, as well as layers, are more perfectly fitted for finally transplanting to the vineyard, by one season's cultivation in nursery rows. During this time they should all be trained to a single shoot, kept upright by staking; the young plants being cut down to two or three eyes when set out, and the strongest only being allowed to grow, rubbing off the others as soon as the young shoots are fairly developed. Pinching off the tips occasionally, after they have reached four or five feet in height, will render the shoot and buds stronger, and the wood will ripen better.

TRANSPLANTING. This is effected most perfectly by making a broad hole, and rounding up the central portion of the bottom. The stem being cut down to two or three strong buds, and very long roots clipped off, the plant is placed with the centre on the rounded surface of earth, and the roots then spread out in every direction, as shown in the following figure (Fig. 423). The hole is filled with finely pulverized earth, which completes the transplanting.

The following is the usual course for forming the plants into bearing vines—three years being required for this purpose, if strong plants are used and good cultivation given. One or two more years are, however, frequently required, if the growth is not sufficiently vigorous:

First Year. The plant having been cut down to two or three eyes when set out, the strongest is trained to a single shoot, the

Fig. 423.

others being rubbed off. The tip should be pinched off after growing several feet, to strengthen the cane.

Second Year. Last year's shoot being cut down to two or three buds, or to a foot or more in height, the same course is to be pursued; but two shoots, instead of one, are to be grown from the two upper buds.

Third Year. If the vine is not very strong, cut down these shoots again, and train two new and stronger ones from them, or cut them back part way and raise shoots from the cut ends. If any fruit bunches are produced, remove them early in the season. The best rule to determine whether to cut back again the third year, is obtained from the size of the canes, which should not be less than half an inch in diameter. If fully of this size the trellis may be erected, and the training of the vines upon them commenced.

Trellis. Different modes of constructing trellis have been

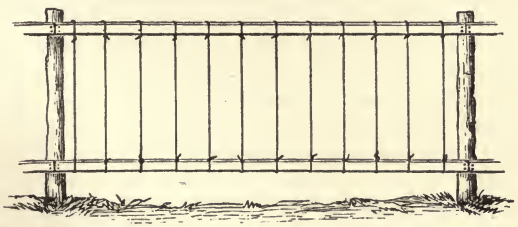

Fig. 424.—*Trellis with upright wires.*

adopted. It is not essential which is used, but the cheapest and most durable is to be preferred. Fig. 424 represents the mode

recommended and adopted by Fuller. It is about four feet high, and if intended for a single series of horizontal arms with vertical bearing canes, now generally approved. If two series of arms are desired, the height may be increased to seven feet. It consists of durable posts placed ten or twelve feet apart, to which horizontal rails are nailed, the upper one at the top and the lower one about a foot from the ground. Between these, vertical wires, about a foot apart, are stretched as shown in the figure. These wires being shorter than when stretched horizontally, need not be so large, and a saving is thus effected in the expense. Each bearing cane is trained to one of these wires.

Another mode is to use wires stretched horizontally, as shown in Fig. 425. The lowest should be a foot or more from the ground, and to this the horizontal arms are tied; the next may be eight or

Fig. 425.—*Trellis with horizontal wires.*

ten inches above for tying the young shoots, and the two remaining ones, each twelve to sixteen inches higher. These distances are recommended by Strong, in his late work on the Grape.

Cultivators differ as to the size of the wire suitable to be employed. Some use even as large as No. 8, which is one-sixth of an inch in diameter, and is thirteen feet to the pound. Others severally employ No. 10, which is twenty feet to the pound; No. 12, which is thirty-three feet, and No. 14, which is fifty-four feet to the pound. For the vertical wire trellis, already figured, No. 16 is large enough, which is over one hundred feet to the pound. When the smaller wire is used, it should pass through holes in the end post, and be brought around at the side, and the end twisted around the main part. This may be easily done by using a strong, round piece of wood about a yard long, around which the end is brought, and which by using as a roller and lever combined, easily accomplishes or renews the desired tension.

The wire used for this purpose should be annealed, and is best

when galvanized. The wires are fastened to the other posts by staples; or easier by two common nails, with heads touching, the lower one a ten-penny, and the upper a six-penny.

Trellis made wholly of wood also answer a good purpose, whether of horizontal bars nailed to posts, or vertical rods nailed to an upper and lower horizontal bar.

TRAINING ON THE TRELLIS. Whatever mode of training is adopted, the following general rules should be observed:

1. Allow no shoots to grow nearer than about one foot of each other.

2. Cut back each bearing shoot at the close of the season to one strong eye, as near the old wood as practicable, to produce bearing shoots another year.

3. Rub off, as soon as they appear, all shoots not wanted.

These rules may be observed for different modes of training, and will succeed well, whether in the vertical, horizontal, or in the fan form; but the following mode will commonly be found the simplest and easiest in practice:

After the two canes have been formed the third year on the young vine, as already described, they are to be cut off to within about four feet of the base, and spread out in opposite directions horizontally, to form the arms. As buds always tend to break into shoots soonest, when bent back from an upright position, and also from the extremities or tips of the canes; these arms, if brought out straight,

Fig. 426.

as in Fig. 426, will produce shoots irregularly, the buds on the middle portions of the arms not breaking at all, while the others may

Fig. 427.

have grown several inches. To prevent this difficulty, bend them in curves, as shown in Fig. 427—the middle portions being highest,

will strike shoots equally with the other parts. As soon as these shoots are well under way, the arms may be brought into a straight horizontal position. If trained to the vertical wire trellis, each shoot should have its appropriate wire, and all others be rubbed off. If the horizontal wire trellis is used, each shoot should be tied to the second wire, as soon as it has grown sufficiently to reach it.

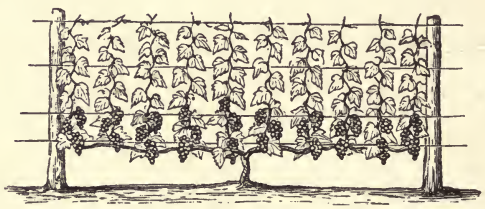

Fig. 428.—*Bearing Vine.*

When the young shoots have reached a few inches above the top of the trellis, they should be kept pinched back to this height, for the rest of the season. Each one will probably set two or three bunches of fruit, and if the canes are strong enough, these may be allowed to remain and ripen, and will present in autumn the appearance shown in Fig. 428, or as in Fig. 428 *a*, after the leaves have fallen.

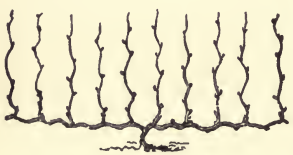

Fig. 428 *a*.

If the vine is intended to be laid down and slightly covered for winter, the pruning may be done at any time after the fall of the leaf. Or if it is desired to use the wood that is cut away for propagating new vines, the pruning should be done before the shoots are severely frozen. As all pruning in autumn increases the liability to injury by the cold of winter, one or two extra buds should be left on the stump, to be cut down the following spring. If the pruning is not done in autumn, it may be performed at any subsequent period before spring.*

Mode of Pruning. When the young arms are first attached to

* *Bleeding*, or the rapid escape of the sap by spring pruning, causes much less injury than is usually supposed, and many cultivators who have made the experiment thoroughly have scarcely perceived any unfavorable result on hardy grapes.

the trellis, each bud, which is intended to form its upright bearing shoots, will present the appearance shown in Fig. 429. After growing one season, as in Fig. 428, each shoot is to be cut down to a good bud, as in Fig. 430. This bud is to grow and form the bearing

Fig. 429.

Fig. 430.

shoot for next year. The pruning should be done as closely as practicable to the horizontal arms, provided one good strong bud is left on the stump or spur. After the pruning is completed, the vines (already represented by Fig. 428) will exhibit the appearance in Fig. 431. The vine is now ready to throw up another set of bearing

Fig. 431.—*Pruned Vine.*

shoots for the coming year. It is the practice of some cultivators to leave two or even three buds on each spur, so as to form two or three bearing shoots from each, in order to obtain a fuller crop. This is, however, drawing too severely on the vine for continued practice. To maintain the vigor of the vineyard, as well as to obtain large, well developed, well ripened bunches and berries, the vines should never be over-cropped; and one shoot from each spur is, therefore, sufficient. The reports which are often made of six, seven, and eight tons of grapes from an acre, may be set down as evidences of bad management and over-exhaustion of the vines. Three to four tons per acre is the largest amount which good and continued success will warrant.

By raising bearing shoots from the same spur for successive years, this spur will become lengthened several inches, or at the rate of about one inch annually. Although little inconveniences result, it is desirable to keep them short; and for this purpose the spur may be cut back to one of the smaller buds at its base, and a new shoot thus brought out to form the beginning of a renewed spur. As this new

shoot springs from a small bud, it should not bear any fruit the same season, but its whole strength be given to the formation of wood to furnish next year's bearing shoot. By selecting each year a small number for this renewal, the process may be going on annually with but little interference with the general crop. Fig. 432 shows the manner in which this result is effected, the dotted line marking the place where the old spur is cut out on the left, for the benefit of the new shoot on the right.

SUMMER PINCHING. At every joint of each new shoot is a strong leaf. In the axil (or arm-pit) of each leaf-stalk, buds are formed, which if allowed to remain will grow into fruiting branches another year. Opposite to each strong leaf is a tendril; or in its place a bunch of fruit, if near the base of strong shoots—tendrils being regarded as abortive fruit-bunches, serving also the purpose of cling-

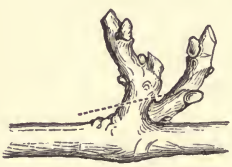

Fig. 432.

Fig. 433.—*Laterals.*

ing to supports and sustaining the vine. These, it will be observed, are opposite the leaf-stalk and bud. From the axil of the leaf-stalk a new and feebler shoot often springs, which is called a lateral—two of which are shown in Fig. 433. Vigorous laterals will sometimes throw out others which are termed sub-laterals. Laterals should be allowed to remain, as displacing them tends to injure or destroy the buds.

To prevent shoots or canes from growing too long, and also for the purpose of increasing the strength of the cane and its buds, the practice of pinching off is adopted, and is generally performed after midsummer. This pinching giving a check to the cane, tends to the emission of laterals, which should also in turn be pinched at their tips.

It is a common practice with most cultivators of hardy grapes, to

pinch off the shoots as soon as three leaves are formed above the upper bunch of fruit. A less number will be insufficient to furnish food for the forming berries; a greater number of leaves would doubtless be better, provided there is room on the trellis. A good rule in practice is to allow the bearing shoots, shown in Fig. 428, to pass a few inches above the top wire, before the tips are pinched off. After pinching, the upper bud will frequently "break," or start into a new shoot—in which case a second pinching should be given, and so on as long as the growing season continues.

Summer pruning consists, in addition to this pinching, in rubbing off all useless shoots when they first appear. Bearing canes should be at least ten inches or a foot apart, and all shoots between them are useless and detrimental, by crowding the foliage, lessening its health and vigor, and drawing strength from the vine. The process of rubbing off is generally begun quite early in summer, or by the time the first shoots are but a few inches in length; and it should be continued or repeated as long as any intruding shoots spring from the vine. If left late, the lopping of large quantities of leaves always injures the vigor of the vine.

Modifications of Training. But one mode has been described, namely, that represented in Fig. 428. Some cultivators

Fig. 434.

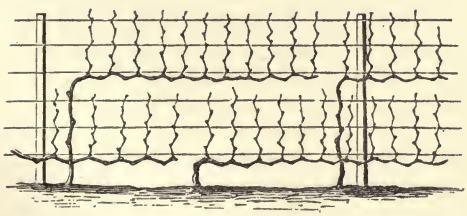

Fig. 435.—*Thomery System.*

adopt a modification of this plan, by employing a single horizontal arm, extended in one direction only (Fig, 434), instead of the two

arms on opposite sides. This mode appears to succeed well, and is regarded as simpler than the other. Another mode is what is termed the Thomery system, and is represented in the foregoing figure (Fig. 435). Its object is to cover a higher trellis where the ground is limited, or to extend the vine over the walls of buildings. It obviates the difficulty of two or more horizontal arms, one above the other, on the same vine, by allowing but a single arm from each, as will be seen by inspecting the figure (Fig. 435). Double the number of vines are planted along the trellis, and every alternate one carried up to the second tier. A greater number of vines may be planted, and the trellis raised to a corresponding degree.

SOIL FOR VINEYARDS.

The long established practice of highly enriching the deep vine borders of exotic grape-houses, formerly misled some cultivators into the practice of heavily manuring the ground intended for vineyards of hardy American varieties. It is now fully proved that land, of moderate fertility is much better. Rich soils produce a strong growth of canes and leaves, at the expense of the fruit, and render the wood more liable to winter-killing. A considerable proportion of clay in the soil, provided there is a perfect under-drainage, is better than light sand or gravel. The most successful vineyards are planted along the borders of large open waters, where the soil is composed of what is termed *drift*—giving a perfect natural drainage. The south shore of Lake Erie, from Dunkirk to Sandusky, extending a few miles inland, and the borders of Crooked Lake, in Western New York, have proved to be admirably adapted to vineyard culture; and other places in proximity to open water, away from frequent fogs, and with a loose or shelly soil, will doubtless be found equally good. While such localities as these should be sought for extended or market cultivation, in nearly every portion of the country vines for a family supply may be raised, by proper under-drainage, and the selection of hardy or productive sorts.

At the same time that moderate fertility is to be sought, constant cultivation must be given through the growing season. The best managers pass the cultivator once a week.

The slow-growing varieties, such as the Delaware, should have a richer soil than more rapid growers. Grapes on highly manured land will grow larger, and present a more showy appearance—but the fruit at the same time will be more watery, and of inferior flavor.

Distances for Planting. The European practice of placing the vines about four feet apart, each way, and training to a single stake, has been adopted to a considerable extent. It succeeds best on poor and light soils, and with the slower growing sorts. Although it does well for a few years, it is not to be generally recommended. Young cultivators, also, fall into the error of placing their vines too near together, when trained with horizontal arms on a common trellis. They bear and succeed well while young, but as they become older require more room. It is a common practice to place the lines of trellis eight feet apart, and the vines twelve feet from each other, along each line of trellis. This distance appears to answer well; but some of the best managers give at least twelve feet each way, and others as much as sixteen feet. The space thus given, not only tends to a more healthy growth and freedom from mildew, but develops larger, finer, and more perfect grapes.

Grape-Houses. It rarely occurs that the foreign varieties are successfully cultivated in the open air, and the protection of glass becomes necessary. A house without fire heat is comparatively cheap, and is managed with moderate attention.

Grape-houses are of three kinds: the *cold house*, which only protects from the exterior changes of the weather, and retains the heat of the earth and of the sun; the *forcing house*, used for ripening early grapes by the assistance of artificial heat; and the *late house*, to be also heated artificially, to ripen, during winter, the later varieties.

Fig. 436.—*Span-roof Grapery.*

The best cold houses are made with *span-roofs*, as in Fig. 436; while the *lean-to* house, Fig. 437, is best adapted to forcing, affording better security against the admission of cold. For this purpose the latter should also have a double wall at the back. To admit the free passage of the roots under the walls, the border being on both sides, the posts should be either stone or brick piers, set deep enough in the ground to be unaffected by frost, and the walls built upon thick connecting slabs of stone near the surface. Posts of durable timber will last many years, when the structure is built of wood. In the latter instance, the back wall should be

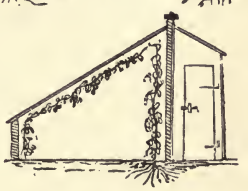

Fig. 437.—*Lean-to Grapery.*

double-planked, and the space between filled with closely rammed dry tar. The sashes for the roof should be of two lengths, lapping slightly at the middle, and sliding past each other in separate grooves.

CURVILINEAR ROOFS FOR GRAPERIES. This is a form often given to the more highly finished class of grape-houses. It possesses some advantages, and when neatly constructed, presents a handsome appearance. But there is another form originated and adopted some years ago by Ellwanger & Barry of Rochester, which is shown in the annexed figure (Fig. 438), and which appears to be a decided

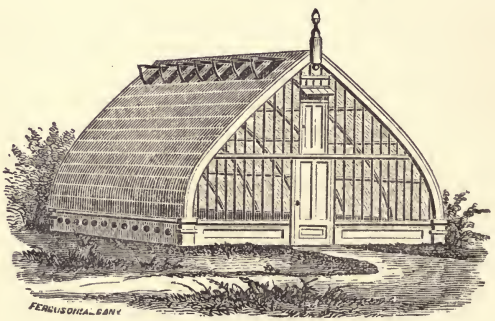

Fig. 438.—*Curvilinear Roofs for Graperies.*

improvement. The base walls, on which the frame rests, are perpendicular; and the lower part only of the frame is curved. This form gives it a neater and less heavy appearance, and is more easily and cheaply constructed. It is occupied as a cold grapery, and is seventy feet long, fourteen feet high, and sixteen feet wide.

BORDER FOR THE VINES. This should never be less than twelve feet wide, and if twenty or twenty-five feet, it would be better. The roots of grape vines run rapidly to a great distance, and it is indispensable to their successful growth to furnish them ample room for extension. J. F. Allen, of Salem, Mass., in his Treatise on the Grape, recommends for a border, a mixture of one-half loam, or the top soil of an old pasture, one-fourth bones or other strong manure, one-eighth oyster shells, lime, or brick rubbish, one-eighth rotten stable manure—varying with circumstances. The bed should be well mixed, and should be two to three feet deep.

The same work states the cost of a cheap lean-to grape-house,

without fire-heat, twelve or fourteen feet wide, at about eight dollars per running foot; and with the addition of a heating apparatus, at ten dollars per running foot, constructed as cheaply as possible.

The training commonly adopted in grape-houses is by means of what is termed *spur pruning*, the side shoots of the main stem (which is carried up from the border to the peak) being managed similarly to the bearing shoots on the horizontal arms already described for hardy grapes, but kept shorter. Fig. 439.

Fig. 439. *Spur pruning.*

It would be impossible, within the space of a few pages, to give full directions for the management of a grape-house. The following brief instructions, from A. J. Downing, contain all that is essential for a cold house:

"ROUTINE OF CULTURE. In a vinery without heat this is comparatively simple. As soon as the vines commence swelling their buds in the spring, they should be carefully washed with mild soap suds, to free them from insects, soften the wood, and assist the buds to swell regularly. At least three or four times every week, they should be well syringed with water, which, when the weather is cool, should always be done in the morning. And every day the vine border should be duly supplied with water. During the time when the vines are in blossom, and while the fruit is setting, all sprinkling or syringing over the leaves must be suspended, and the house should be kept a little more closed and warm than usual, and should any indications of mildew appear on any of the branches, it may at once be checked by dusting them with flour of sulphur. Air must be given liberally every day when the temperature rises in the house, beginning by sliding down the top sashes a little in the morning, more at mid-day, and then gradually closing them in the same manner. To guard against the sudden changes of temperature out of doors, and at the same time to keep up as moist and warm a state of atmosphere within the vinery as is consistent with pretty free admission of the air during sunshine, is the great object of culture in a vinery of this kind."

Further directions for the management of grape-houses will be given in the Monthly Calendar of work.

A successful manager of grape-houses gives the following as the leading requisites for success with a cold grapery:—"First, the border must be well drained, or naturally dry, and have a depth of two and a half or three feet of good soil—an old pasture sod, with

about one-third its bulk of old manure, will be good enough Secondly, the pitch of the roof should be rather flat, say thirty to thirty-five degrees, which is better than a high one, although it may not look so well. In the flat pitch the vines break and bear more uniformly from bottom to top. Thirdly, abundant ventilation—especially at the top of the house. Fourthly, constant care in regard to little details—watering, ventilating, pinching off and tying in shoots, thinning the bunches, arresting mildew, etc. Fifthly, good selection of sorts—hardy ones, like the Black Hamburgh and Muscadine. The Chasselas sorts will succeed when the Muscat and other fine varieties, that need fire heat, will fail."

PROPAGATING HOUSES FOR THE GRAPE.

The extensive propagation and culture of the vine seems to require a brief description of the construction of propagating houses. One of the best and simplest which the author has met with, is the following, adopted and successfully used by E. W. Herendeen, of Macedon, N Y.

With some modification, these buildings may be used for "orchard houses," for fruit-trees in pots, or for fire-heat graperies.

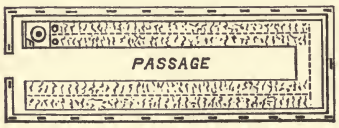

Fig. 440.

A plan of the smaller size is represented by Fig. 440, and the house is constructed as follows:

Set two rows of cedar posts into the ground about two and a half feet deep, and beat the earth about them well—the rows of posts being eleven feet apart, and the posts six feet apart in the row—saw the tops off on a level three and a half feet above the ground; board them on both sides and fill in the space with tan or saw-dust. Nail to the top of these posts thus sawn off, a scantling two by five feet for a plate to the house. On the inside of the house set two other rows of posts at the same depth as the others, and opposite each one, and at a distance of three feet and four inches from them. These posts are the support of the inside of the tank. Fasten a scantling two by five feet in lengthwise along these posts and parallel with the plates, by sawing out of the posts and letting them into the side an inch or so. The scantling should be about twelve inches from the ground. Run a short scantling from the under side of the long scantlings to the posts supporting the plate, letting

them into the posts about one inch, and nailing all securely by using twenty-penny nails. Then put a scantling lengthwise with the house and parallel with the one on the inside of the tanks on the top of the short pieces last mentioned, and near the posts supporting the plate of the house to support the outside of the tank; of course at the same height from the ground. All this framework should be very securely made, to prevent the tanks, when filled with water and covered with heavy sand, from settling, as they are sure to do if not well done. The tanks are easily made by using pine plank, an inch and a half thick, planed and matched at the planing-mill, cutting a groove at each end and driving them in paint upon side pieces five inches high. They may be three and a half feet wide, and should extend on two sides and one end of the house, and be divided lengthwise by a board on edge, which supports the middle of the covering placed over them for holding the sand used for propagating purposes. The water should be about three inches deep in the tanks, which for this purpose should be very carefully levelled. These tanks are covered with thin boards, which, when damp, is a good conductor of heat from the hot water below. The sand should be clean building or lake sand—not too fine or too coarse—and about three inches deep for starting grape cuttings.

The larger house (Fig. 440 *a*) is twenty-two feet wide and seventy-five feet long, and is double, being divided into two parts for heating the propagating beds, but open in one in other respects. The same

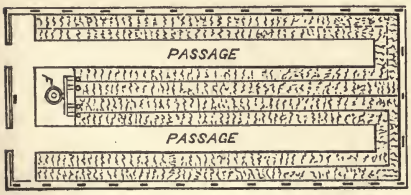

Fig. 440 *a*.

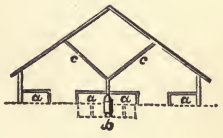

Fig. 441.

furnace heats both these parts by branching pipes. A cross section of the double house is shown in Fig. 441.

The houses thus constructed are heated by a simple and efficient furnace, made at the locomotive works at Geneva, N. Y. The furnace for the larger house is shown in the annexed figures, where 442 is a view, and 442 *a*, a section. It is made of boiler iron, riveted to circular cast-iron plates at top and bottom, with a space within for fire, surrounded by water, with the exception of the grate at bot-

tom. The stratum of water surrounding the fire is about an inch thick.

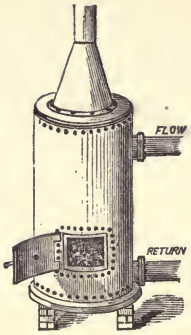

Fig. 442.

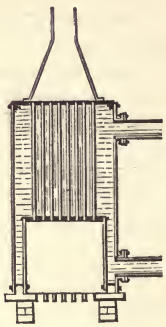

Fig. 442*a*.

Forty-three pipes, from the fire through the upper plate, carry the hot air and smoke to the expanded smoke pipe, and heat the water with great rapidity. The amount of fuel required has been found to be only two-thirds the amount for other heaters in common use.

The size of the boiler for the larger house is about twenty inches in diameter, and three and a half feet high, and smaller for the other house. The hot water pipes connecting with the tanks should be three inches in diameter inside for the small house, and four inches for the larger. Six tons of coal only were used throughout the entire season of spring propagation, for both houses.

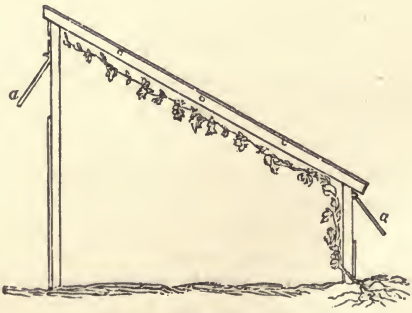

Fig. 443.

An improvement in *cheapness of construction* for a lean-to ***cold***

grape house, is represented in the preceding figure (Fig. 443). The walls are made by setting posts into the ground, and covering with a rough, whitewashed board siding. The cover of glass is greatly simplified and cheapened by *fixed sashes*, the necessary ventilation being effected by the board shutters, *a*, *a*, opening outwards on hinges, and placed at intervals along the back and front walls.

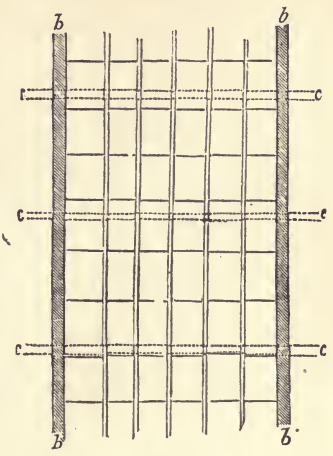

Fig. 444.

Fig. 444 represents a portion of the glass roof—*b*, *b*, are the rafters; *c*, *c*, are cross-bars, made of strips of inch board about two and a half inches wide, set on edge, and narrowed at the rafter and let into it sufficiently to be on a level with its top. These cross-pieces support long slender bars parallel with the rafters, and formed on the top in the shape of a common sash-bar, to receive the glass.

Raising Grapes from Seed, New Varieties.—Procure well-ripened grapes, wash the seed from the pulp, and mix them at once with moist sand or leaf-mould. Bury them in open ground till early spring. They should not be allowed at any time to become dry, and care should likewise be taken to prevent their becoming water-soaked. They should, in fact, be treated as cherry stones and pear seeds are managed by nurserymen. Be careful to secure them from mice. Plant in spring, in beds of *deep rich soil*, in drills a foot or two apart, and an inch or two apart in the drills, and about an inch deep. Shade the young plants for a few weeks. Provide small stakes for their support, and mulch the surface with an inch or so of good fine manure. If dry weather occurs, give the ground a thorough soaking as often as once a week. Lay down and cover in winter. The great point is a *deep* and *rich* soil, so as to give the young plants a vigorous start.

ARRANGEMENT OF VARIETIES.

NATIVE GRAPES.

CLASS I. *Dark red, purple or black.*
CLASS II. *Light red or brown.*
CLASS III. *White, yellow or green.*

FOREIGN GRAPES.

(The same arrangement is adopted for Foreign Grapes.)

NATIVE GRAPES.

CLASS I. *Dark red, purple, or black.*

ADIRONDAC. Bunches rather large, compact, shouldered ; berries medium, round ; skin thin, dark, nearly black, covered with a delicate bloom ; flesh tender, with little or no pulp, with a mild, sweet, agreeable flavor. Vines and leaves resemble those of the Isabella, and are about as hardy. They are somewhat liable to mildew. Ripening very early, or with the Hartford Prolific, and successful and valuable in warm localities.

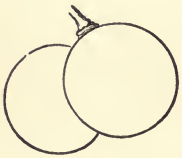

Fig. 445. *Adirondac.*

Alexander's. (Cape Grape, Schuylkill Muscadel, Spring-Hill Constantia.) Bunches not shouldered ; compact ; berries medium, nearly round, slightly oval ; skin thick, black ; pulp firm, coarse, acid until fully ripe ; season late. Worthless in New England and New York ; good further south. A native of Penn.

Alvey. Bunches medium, loose, shouldered; berries small, round ; skin thin, black ; bloom thin, blue ; flesh without pulp, vinous. A strong grower. Good in quality ; not profitable. Penna.

Barry. (Rogers' No. 43.) Bunch rather large, short and broad ; rather compact, sometimes shouldered ; berry large, roundish, black ; flesh nearly free from pulp, sweet and agreeable. Rather early, ripening with Concord. Vine a strong grower and good bearer.

CATAWBA. Bunches medium in size, shouldered ; berries large, deep coppery red, becoming purple when fully ripe ; flesh slightly pulpy, juicy, sweet, aromatic, rich, slightly musky. Does not ripen well as far north as 43° latitude, except in warm exposures. Very productive.

Clinton. Bunches medium or small, not shouldered, compact; berries nearly round, small, black; bloom thin, blue; pulpy, juicy, with a slightly harsh flavor. Very hardy and rather early. Western New York. Requires thorough maturity to develop its flavor. A good keeper.

CONCORD. Bunches compact, large, shouldered; berries large, round, almost black, covered with bloom; skin very tender; flesh juicy, buttery, sweet. Ripens ten days before the Isabella, is healthy, vigorous, and very productive. The extreme hardiness, vigor, and productiveness of the vine, and the large size and fine appearance of the bunches and berries, have rendered the Concord one of the most popular market sorts, although inferior to several others in flavor. It succeeds well throughout the entire West. The fruit is too tender for shipping long distances.

Cornucopia. (Arnold's No. 2.) Bunch large, compact, shouldered; berry above medium, black; flavor pleasant, very good; ripens with Concord. A cross of Clinton and Black St. Peter's. Hardy, productive.

CREVELING. Bunches medium, rather loose, shouldered; berries rather large, nearly round, black, with little bloom; flesh with a rather sweet and an excellent flavor. Vine hardy and vigorous. Early—ripens nearly with the Delaware. Penn. The bunches on the young vines are often quite loose, but afterwards become more compact.

Cynthiana. Bunch moderately compact, shouldered; berries small, round, black. Resembles Norton's Virginia, but better. South-west.

Elsinborough. (Elsinburgh.) Bunches rather large, loose, shouldered; berries quite small, skin thin, black; bloom blue; pulp none; melting, sweet, excellent. Leaves deeply five-lobed, dark green; wood slender, joints long. Hardy. New Jersey.

Essex. (Rogers' No. 41.) Berry large, tender, sweet; bunch short, shouldered. Ripens with Concord.

Eumelan. Bunch medium in size; berry rather small, black, tender, sweet, excellent. Vine moderately vigorous; a good bearer. Early. Origin, eastern New York.

HARTFORD PROLIFIC. Bunches large, shouldered, rather compact; berries rather large, round; skin thick, black, with a bloom; flesh sweet, rather juicy, with some toughness and acidity in its pulp; ripens one week before the Concord. Hardy, vigorous, productive. Valued for its earliness and easy cultivation.

Herbemont. (Warren, Neal.) Bunches large, compact, shouldered; berries small, round, dark blue or violet, with a thick, light bloom; skin thin, pulp none, with a sweet, rich, vinous, aromatic juice. Vigorous grower. Tender at the North. Succeeds well as far south as Cincinnati.

Herbert. (Rogers' No. 44.) Berry medium, sweet, a little pulpy; bunch rather loose; moderately productive. Ripens with Concord.

ISABELLA. Bunches rather large, shouldered; berries round oval, rather large; skin thick, dark purple, becoming nearly black, bloom blue; tender, with some pulp, which lessens as it ripens; when fully ripe, juicy, sweet, rich, slightly musky. Ripens in favorable aspects as far north as 438 lat., except in cold seasons. Very vigorous, profusely productive. Origin, South Carolina.

The *Garrigues*, *Payn's Early*, and *Louisa*, claim to be earlier than the Isabella, but differ from it little if any.

Israella. Bunches medium, shouldered, very compact; berries medium, slightly oval, black; flesh tender to the centre, with a peculiar, rich, and pleasant flavor. Early, ripening with Concord. Vine vigorous, healthy, and hardy. Peekskill, N. Y. Keeps well.

Ives. Bunch medium, compact, shouldered; berry rather small, roundish oval, black, with some pulp, of moderate quality, its chief value for wine. Origin, Cincinnati; season medium, or rather late.

Lenoir. Bunches large, handsome, compact, little shouldered; berries small, round; skin thin, dark purple, bloom slight; tender, with no pulp, melting, sweet, excellent. Wood long-jointed, leaf three-lobed. Origin, Carolina. Closely resembles Herbemont.

Logan. Bunches medium, shouldered, compact; berries rather large, oval, black; flesh juicy, with little pulp, and a moderate flavor. Vine a slender grower; leaves small, three-lobed. Early.

Miles. Bunch and berry small; juicy, vinous, good. Hardy; moderate grower, productive.

Merrimack. (Rogers' No. 19.) Bunch medium, rather short; berry large, round, black; flesh tender, sweet, of good quality. Quite early.

Missouri. Bunches loose; berries small, round; skin thin, nearly black; tender, sweet, pleasant, with little pulp; moderately productive, growth slow, wood short-jointed; leaves deeply three-lobed.

Mottled. Bunches medium, compact; berries medium, round, mottled, changing to purple; sweet and sprightly, very good. Ripens soon after Delaware, hangs long. Kelly's Island, Lake Erie.

NORTON'S VIRGINIA. Bunches long, moderately compact; berries small, round; skin thin, dark purple; pulpy, vinous, somewhat harsh, rather pleasant and rich. Shoots strong, hardy. Mostly grown at the South and West.

Ohio. (Longworth's Ohio, Segar-Box.) Bunches large, long, loose, tapering, shouldered; berries small, round; skin thin, purple, bloom blue; tender, melting, sweet, excellent, with no pulp; a good bearer. Shoots long-jointed, strong; leaves large, three-lobed; origin unknown. As far south as Cincinnati it succeeds well, but tender further north.

Raabe. Bunches small, compact, rarely shouldered; berries small, round, dark red, thick bloom; flesh very juicy, scarcely any pulp, good. Phila.

Senasqua. Bunch medium, sometimes large, compact; berry medium, purplish black, tender, juicy, free from pulp, becoming sweet when fully ripe; very good. Origin, Croton Point, N. Y. A cross of Concord and Black Prince.

Telegraph. Bunch above medium, compact; berry rather large, round, black, juicy, with some pulp, of moderate quality, valuable for its earliness (ripening about the same time as Hartford); vine hardy, vigorous. Origin, near Philadelphia.

To-Kalon. Bunches large, shouldered; berries varying from oval to oblate, dark, with a bloom; sweet, excellent, without foxiness, toughness, or acidity. Perfectly hardy, and with good treatment an early and abundant bearer. A little earlier than the Isabella. Lansingburgh, N. Y. Liable to rot, and variable in ripening and quality.

Union Village. (Ontario.) Bunches very large, compact, shouldered; berries very large, round; skin thin, black, with a bloom; sweet, with a pleasant, moderate flavor. A good and very showy sort, rather tender at the North.

WILDER. (Rogers' No. 4.) Bunch large, compact, shouldered; berry large, round, black, with a thin bloom; flesh tender, with a little pulp, sweet, slightly aromatic, of good quality. Ripens with Concord; succeeds in many localities.

CLASS II. *Light red or brown.*

Agawam. (Rogers' No. 15.) Bunch large, moderately compact, and shouldered. Berry large, nearly round, dark dull reddish-brown. Flesh tender, little pulp, very slightly partaking of the foxy aroma; of good vinous flavor. Season medium, or soon after Concord. Vine a strong grower and great bearer, but the fruit easily affected by rot.

Bland. (Bland's Virginia, Powell.) Bunches loose; berries round, pedicels long; skin thin, pale red; flesh slightly pulpy, pleasant, delicate, sprightly. Late. Rarely ripens well as far north as 43° lat. A moderate bearer. Origin, Va.

DIANA. A seedling from the Catawba, which it resembles, but paler, or a pale grayish red; bunches compact; berries round, almost without pulp, juicy, sweet, rich. It ripens best on poor soils. Origin, Milton, Mass.

One of the most highly esteemed American grapes—its character being lessened by variableness in ripening on the same bunch and by a difference in quality in different localities. An excellent keeper, retaining its freshness through winter.

Catawba, see last class.

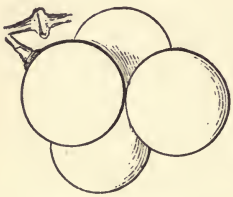

Fig. 446.—*Diana.*

Fig. 447.—*Delaware.*

Fig. 448.—*Iona.*

DELAWARE. Bunches small, compact, generally shouldered; berries smallish, round; skin thin, light red, translucent; exceedingly sweet, aromatic. Early. A vigorous grower under high culture; requires a strong, rich soil. An early and profuse bearer. Hardy. Delaware, Ohio. One of the most excellent and popular of all American grapes, especially at the North and East; often injured by overbearing.

Diana Hamburgh. Bunches large, compact, shouldered; berries large, round, dark red when fully ripe, tender, free from pulp, sweet, aromatic. Season between Concord and Diana. Raised from seed of the Diana impregnated with Black Hamburgh, by J. Moore, Rochester, N. Y. A slow grower.

Goethe. (Rogers, No. 1.) Bunch rather large, moderately compact, shouldered; berry quite large, oval, yellowish green, often more or less blotched or shaded dull red; flesh tender, with no pulp, sweet, slightly aromatic, and when well ripened of excellent quality. Rather late, occasionally ripening well at the North, better at the South. Vine vigorous and productive. This has more of the exotic character than any other of Rogers' hybrids, and therefore less reliable and more subject to mildew.

Iona. Bunches large, shouldered, not compact; berries medium, round, pale red, becoming dark red at maturity; flesh tender, with little pulp, and with a rich, slightly vinous, excellent flavor. Peekskill, N. Y. Fails in most localities, and often much injured by overbearing.

Lindley. (Rogers' No. 9.) Bunch medium in size, rather long and compact; berry medium, nearly round, reddish, sweet, slightly aromatic, very good when well grown. Rather early. Vine vigorous and productive.

Massasoit. (Rogers' No. 3.) Bunch medium, rather loose; berry rather large, roundish, light red, sweet, good; early, a little before Concord. Vine moderately vigorous.

Michigan. Bunches large, often two-shouldered; color resembling Catawba, but redder, juicy, sweet, rich, with a fine perfume. Ripens two weeks before Catawba.

Northern Muscadine. Bunches small, short, compact; berries medium, round, brownish red; skin thick, with the character and odor of the brown Fox grape. The berries fall from the bunch as soon as ripe, which is about one week before Concord. New Lebanon, Columbia co., N. Y. Valuable only for its earliness and extreme hardiness.

Salem. (Rogers' No. 22.) Bunch large, short, rather compact; berry large, round, dark dull red; tender, nearly free from pulp, of a moderate but very agreeable flavor. Season medium. Vine vigorous and productive; succeeds in many localities.

Scuppernong, see next class.

Venango. Bunches compact; berries fine lilac; pulp tough, but with a peculiar, aromatic flavor, which makes it valuable for kitchen use. Two weeks before Catawba. Vigorous. Hardy.

WALTER. Bunch moderate in size, shouldered, compact; berry medium, round, light red, skin thick, flesh sweet, aromatic, of excellent flavor; season medium. Origin, Poughkeepsie, N. Y., a cross of Delaware and Diana.

CLASS III. *White, yellow or green.*

Anna. Bunches large, loose, shouldered; berries large, white, with a thin white bloom; flesh tough at the centre, juice between pulp and skin sweet and excellent. October—too late for ripening at the North. A seedling of the Catawba.

Allen's Hybrid. Bunches rather large, shouldered, compact; berries medium, round; skin thin, pale amber when fully ripe; flesh tender, without pulp, with a sweet, rich, delicious flavor. A hybrid between native and exotic species, moderately hardy, much liable to mildew. Season medium.

Cassady. Bunches medium, compact, sometimes shouldered; berries small, round, greenish white, sometimes with a pale amber blush; flesh juicy, little pulp, flavor pleasant, good. Phila. Strong grower, leaves woolly beneath. Fails in some localities.

Clara. Bunches medium, loose; berries medium, round, green; flesh tender, juicy, rich, sweet and delicious. Phila. Of foreign parentage.

Croton. Bunch medium in size, not very compact, shouldered; berries varying from small to medium, light greenish yellow; skin thin, flesh juicy, sweet, with an excellent pleasant flavor. Ripens early. A cross of the Delaware with the Chasselas; liable to mildew in some localities.

Cuyahoga. Bunches medium, shouldered, compact; berries rather large, round, pale greenish white, bloom thin; flavor moderate. Too late for the North and liable to mildew.

Lydia. Bunches above medium; berries large, oval, greenish white, with a tinge of rose in the sun; sweet, excellent. Ripens with the Delaware. C. Carpenter, Kelly's Island, Ohio.

Martha. Bunches medium, rather loose, shouldered; berries large, round, pale yellow; slightly pulpy, sweet, juicy, a little foxy. Vine a hardy, healthy, and strong grower. A seedling of Concord.

Mary. Bunches quite large, loose; berries medium, round, nearly white, translucent; flesh tender, little pulp, sweet and sprightly, very good. Rather late. Kelly's Island.

MAXATAWNEY. Bunches medium, moderately compact, not shouldered; berries light greenish yellow, tinged with amber; flesh tender without pulp when ripe, quality excellent. Vine hardy. Ripens rather late. The Maxatawney much resembles the Rebecca in flavor and general appearance, but while it is hardly equal to the latter in quality, it is a better grower. Berks co., Penn.

REBECCA. Bunches nearly cylindric, compact, heavy, often shouldered; berries, medium, oval; color light green in the shade, golden in the sun, with a light bloom, somewhat translucent; flesh juicy, sweet, delicious. Ripens nearly with Concord, and keeps a long time. When fully ripe, one of the finest-flavored of all grapes. Moderate grower; foliage tender. Hudson, N. Y.

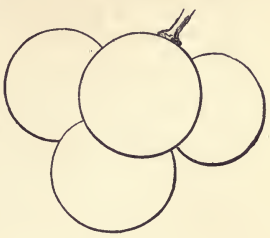

Fig. 449.—*Rebecca.*

Scuppernong. (Fox Grape or Bullet Grape of the South, American Muscadine.) This is a distinct Southern species, the *Vitis vulpina.* Bunches very small, loose; berries round, large; skin thick; pulpy, juicy, sweet, strongly musky. The "White" is light green; the "Black" dark red; the color of the tendrils corresponding in each variety. Leaves quite small, glossy on both sides. Very tender at the North.

Taylor's Bullitt. Bunches medium, loose, with many imperfect berries; berries rather small, greenish white, of moderate quality. A strong grower. Ky.

FOREIGN GRAPES.

CLASS I. *Dark red, purple, and black.*

Black Barbarossa. (Prince Albert.) Bunches very large, shouldered, compact; berries large, black, with a thick bloom; juicy, of fair quality. A new, popular, late exotic sort. Very late.

Black Cluster. (Burgundy, Black Burgundy, True Burgundy, Small Black Cluster, Early Black, Black Orleans.) Bunches small, very compact; berries rather small, roundish, black, sweet, good. Season early mid-autumn. Hardy in N. Y. Distinguished from Miller's Burgundy by the absence of down on the leaf.

BLACK FRONTIGNAN. Bunches rather long, scarcely medium size; berries medium, round, black; musky, sweet. The Blue Frontignan has more compact bunches, with berries nearly round, purplish, less musky, and not quite equal to the preceding.

BLACK HAMBURGH. (Red Hamburgh, Purple Hamburgh, Brown Hamburgh, Frankendale, Hampton Court Vine.) Bunches large,

shouldered on both sides; berries very large, roundish, sometimes oval, deep brownish purple, becoming black; flavor sugary and rich. A good bearer. Needs a grape-house, rarely ripening well in the open air. The best variety for cultivation under glass.

The *Muscat Hamburgh* is a musky, rich, excellent sub-variety, with large bunches and large dark berries.

Wilmot's New Black Hamburgh is similar, bunches shorter, fruit larger, bloom very thick, flesh firm, a little coarser, but nearly or quite equal to the common Hamburgh. Allen says it is uncertain in quality, often fine, but as often too astringent; it requires always to hang long after it has colored before cutting; in a poor situation it does not set well.

Black Lombardy. (West's St. Peter's.) Bunches large, shouldered; berries large, roundish oval, black; flavor rich. Keeps well. Late. Leaves small, becoming purple.

Black Muscat of Alexandria. Bunches large, shouldered; berries large, oval; skin thick, reddish, becoming black; flesh firm, rich, musky. Requires fire-heat.

Black Prince. Bunches very long, not wide at base; berries large, thinly set, oval; skin thick, black, with a thick blue bloom; flavor sweet and excellent. A good bearer. Sometimes ripens in the open air at the North.

Black St. Peter's. Bunches rather large and loose; berries large, round, black, sweet, of excellent flavor. Ripens late; well adapted to a cold vinery.

Black Tripoli. Bunches medium, shouldered, rather loose; berries large, round, purplish black; sweet, rich, high flavored. Rather late; requires fire-heat.

Early Black Bordeaux. Bunches short, shouldered; berries medium, tender, melting, rich. An excellent early sort.

Early Black July. (July Madeleine.) Bunches small, compact; berries small, spherical, black, bloom blue, skin thick; flavor acid, becoming rather sweet, not rich. Very early; ripens in open air soon after midsummer.

Esperione. Bunches very large, shouldered; berries dark purple, bloom thick; pleasant, not rich. Rather hardy—a strong grower.

Fintindo. Bunches large, compact, shouldered; berries large, roundish oval, dark purple; sweet, rich, aromatic. Resembles Black Hamburgh, but earlier.

Lady Downe's. Bunches large, loose, shouldered; berries rather large, roundish oval, firm, sweet, rich. Hangs long after ripening. A valuable late sort.

Miller's Burgundy. Bunches short, thick, compact; berries roundish oval; skin thin, black, with a blue bloom; flesh tender, sweet, high flavored. An old, well known sort, hardy in most localities.

Schiras. Bunches long, loose, shouldered; berries irregular, oblong oval, reddish purple, bloom thick; flesh juicy, sweet, aromatic, excellent. Quite early; a strong grower.

Zinfindal. Bunches large, shouldered; berries medium, round, very black; acid, becoming good when fully ripe.

CLASS II. *Light red or brownish red.*

GRIZZLY FRONTIGNAN. (Red Constantia, Red Frontignan, Gray Muscat.) Bunches rather long, tapering, slightly shouldered; berries above medium in size, round, compact; reddish gray, bloom thick; juicy, rich, musky, high flavored; hangs well; ripens before Hamburgh and the other Frontignans. For forcing, cold or late house. The berries are liable to shrivel, and are delicate and do not keep well when ripe.

Lombardy. (Red Lombardy, Queen of Nice, Flame Colored Tokay, Wantage, Rhemish Red.) Bunches large, very compact, requiring thinning, shouldered; berries large, roundish; skin thick, pale red: flesh firm, with a moderate flavor.

Red Chasselas. (Red Muscadine.) Bunches medium, loose; berries medium, round, pale green, soon becoming red; sweet, very good. Young wood red.

Red Traminer. Bunches small, compact; berries small, round, rose color, flavor good.

CLASS III. *White, green, or yellow.*

Charlesworth Tokay. Bunches long, compact; berries large, oval, white; skin thick, with a rich, excellent, Muscat flavor. Hangs long, and is adapted to a forcing or late house. English.

Ciotat. (Parsley-leaved.) Bunches medium, rather loose; berries round; skin thin, white; pleasant, but not rich. Leaves deeply divided; grows in open air, but much better under glass.

Early White Malvasia. (Grove End Sweetwater, Early Chasselas, White Mellier.) Bunches medium, shouldered; berries small, yellowish white; skin thin; sweet, juicy, agreeable. Early, good bearer, ripens in open air.

Golden Champion. Bunch large, shouldered; berries quite large, oval or round; firm, juicy, tender, very rich.

Golden Hamburgh. Bunches large, shouldered; berries large, oval, pale yellow; skin thin; flesh tender, rich, vinous, showy. Ripens with Black Hamburgh. A fine new white grape.

Musk Chasselas. Bunches medium, loose; berries medium, round, yellowish white; juicy, very rich, musky. Liable to crack.

Pitmaston White Cluster. Bunches small, compact, shouldered; berries large, round, amber colored, sometimes with a little faint russet when fully ripe; skin thin, flesh tender, juicy, rich, of fine flavor. Open air, cold or forcing house. A seedling from Black Cluster. Very early and good.

ROYAL MUSCADINE. (Chasselas, White Chasselas, Early White Teneriffe, Chasselas de Fontainebleau, White Muscadine of some.) Bunches large, long, sometimes shouldered; berries rather large, round, greenish, becoming a golden amber; skin thin, flesh tender, rich, delicious. Does not hang well—cracks some seasons. Distinguished from Sweetwater by its larger berries and stronger growth of shoots.

Chasselas de Bar Sur Aube much resembles the Royal Muscadine, but is earlier, and rather superior in flavor; the bunches, under good cultivation, are often ten or twelve inches long, usually not shouldered; very productive. For forcing or cold house. Golden Chasselas is earlier—the bunch sets badly.

Syrian. Bunches enormously large—have weighed 19 lbs., being 22 inches long and 19 broad—irregular, shouldered; berries large, oval, tawny yellow; skin thick, flesh firm, solid, moderately juicy and sweet, not rich. Late; needs fire-heat; hangs well. Wood and foliage large. Supposed to be the grape of Eshcol, mentioned in the Sacred Scriptures.

WHITE FRONTIGNAN. (Muscat Blanc, White Constantia.) Bunches medium in size or long, sometimes shouldered, usually not, rather dense; berries medium or large, round, dull white or yellow, when well ripened a beautiful amber, bloom thin, skin thin; tender, rich, perfumed—one of the best Muscat grapes. Productive in a vinery, adapted to a cold, forcing, or late house—requires a dry situation; on a wet soil not worth cultivating. Ten days later than Hamburgh.

White Hamburgh. (White Lisbon, White Portugal, White Raisin.) Bunches large, loose; berries large, oval; skin thick, greenish white; flesh with a slight Muscat, rather poor flavor. The famous Portugal grape of commerce.

WHITE MUSCAT OF ALEXANDRIA. (Jerusalem Muscat, Malaga, Frontignac of Alexandria, Passe Musqué.) Bunches very large, 9 to 12 inches long, loose, irregular, do not set well; berries very

large, oval, pale amber, skin thick; flesh firm, crisp, rich, delicious, perfumed—often seedless. One of the richest Muscat grapes. Needs a vinery, and best with fire-heat—hangs long. It is a firm-fleshed or breaking grape, and, when well ripened, cannot be exceeded in richness.

The *Cannon-Hall Muscat* is a seedling sub-variety, improved in size, but hardly so rich in flavor, and uncertain in bearing.

The *Tottenham Park Muscat*, also a sub-variety, is not quite so rich as the original, but sets better, and hangs well.

Bowood Muscat is a cross of the Cannon-Hall and Muscat of Alexandria. Bunches very large, well shouldered; berries large, inclining to obovate, greenish yellow; flesh firm, juicy, with a rich, sugary, Muscat flavor. A new variety of high promise.

Portuguese Muscat resembles the White Muscat, but is more highly musk-flavored.

White Nice. Bunches very large—have weighed eighteen pounds—shouldered, loose; berries medium, or rather small, round; greenish white, approaching yellow, sweet, good, rich-flavored; hangs well. Growth strong, leaves very downy beneath. Needs fire-heat.

White Rissling. Bunches medium, compact; berries rather small, round, juicy, tender, sprightly.

White Sweetwater. (Early White Muscadine, White Muscadine *of Lind.*, Early Sweetwater.) Bunches medium in size, loose, usually shouldered; berries medium in size, round, yellowish green, skin thin; crisp, watery, sweet, moderately rich. Inferior to Royal Muscadine, but two weeks earlier, ripening by the end of summer. Ripens in open air; shoots tender.

White Tokay. (Genuine Tokay.) Bunches medium in size, compact; berries round-oval, dull white; skin thin; delicate, sweet, perfumed. Leaves deeply five-lobed, lower surface with a silky down. Ripens in open air.

Verdelho. Bunches rather small, loose; berries small, varying in size; yellowish green, a little translucent, slightly acid, becoming rich and excellent. Strong grower.

CHAPTER IX.

THE STRAWBERRY.

In the cultivation of this early and delicious fruit, the requisites for success are chiefly :

1. A good, deep, rich soil.
2. Clean cultivation between the rows.
3. A renewal by planting as often as the vigor of the plants declines.
4. Selection of suitable varieties.

Soil. Any deep, rich soil, which will afford fine crops of corn and potatoes is well adapted to the cultivation of the Strawberry. To be uniformly productive, it must be deeply trenched, either by the spade or by double ploughing, and well enriched with manure. Fine crops, it is true, may be obtained without trenching, but not in such excellence, profusion, or certainty, in all seasons. It rarely, but sometimes happens that the soil is made too rich. The usual error is the reverse.

Strawberries are increased by rooted runners, which are usually thrown out from the plants soon after bearing, and they root late in summer and in autumn. These new plants succeed best if set out the following spring ; but strong plants may be set out in autumn in light soils, or in heavier soils if the roots are carefully spread out and the earth trodden compactly.

Transplanting. Early in the spring is the best season for setting out strawberries. If the work is done well they will bear a moderate crop the same season, and a heavy one the next. The best plants are the well rooted runners from last autumn. They should be well taken up, so as to secure all the fibres, lifting the roots out with a spade and shaking the earth carefully from them ; if pulled

severely by the hand the roots will be torn off. The older and dead leaves should be cut off from the plants, and the roots trimmed to about two and a half inches long. For ordinary field culture they may be set out with a dibble (Fig. 450), care having been pre-

Fig. 450.—*Strawberry plant set out with a dibble or in the common way.*

Fig. 451.—*Strawberry plant set out by spreading the roots.*

viously taken to immerse the roots in mud to prevent drying. But for more finished or for garden culture, it is better to spread the roots out like the frame of an umbrella (Fig. 451), and set them in a hole broad enough, with a small mound in the centre, on which the spread roots rest, and form a cap, as shown in Fig. 452.

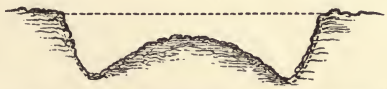

Fig. 452.—*Hole for setting the spread roots of a strawberry plant.*

Next to early spring the best season at the North for transplanting is just after the crop has been gathered, during the period of suspension in growth which occurs at that time. The plants will immediately take root, become well established before winter, and bear a good crop the following season. As the weather is often quite dry and warm at this time, precaution must be used to prevent the plants from perishing by drought. All the leaves, except the small central ones, should be cut off, the roots kept wet and carefully spread out when set, as just described. The earth should be well settled about them with water, and mellow earth then drawn over the surface. A covering of fine manure, an inch or two in thickness, is then spread on the ground to preserve the moisture.

It is only in cases of severe drought that further watering is required. But when given it should be copious and repeated daily until the fresh leaves begin to expand. By this treatment scarcely a plant will be lost.

Transplanting early in autumn, although succeeding well as far south as Philadelphia, or even at New York city, is often attended with failure further north, the plants being thrown out and frozen in winter. Treading the earth firmly about the plants when set, lessens the liability to winter killing.

A spontaneous renewal of plants, may be effected by allowing runners to fill up the spaces between the rows, and then spading in the old rows. By thus filling alternate spaces in two successive years, an annual supply of fruit is afforded. This method of renewal has not been generally adopted.

Mulching among the plants, to keep the berries from becoming soiled with earth, should not be omitted. Straw answers a good purpose, and is more easily and neatly applied, if chopped short, say two or three inches. Rye straw, threshed by hand, will lie more smoothly than any other long straw. Applied in autumn, straw will protect from winter killing, and may be renewed or retained in spring.

CULTIVATION OF STRAWBERRIES.—Clean cultivation is a most essential requisite. On a large scale, it may be very cheaply accomplished by a horse and cultivator, the rows being about three feet apart, and the plants a foot to a foot and a half in the rows. The treatment may be varied with circumstances, provided the great leading requisite is constantly kept in view, namely, *to allow no weeds to get above the surface.* This is the great cardinal essential, which must not be departed from. After the plantation is set out in clean, well prepared soil, stir the ground often enough to destroy the sprouting weeds before they get to the light. The work may be then done with less than a tenth of the labor required after the weeds are several inches high; and all the labor of this frequent stirring is more than repaid by the increased growth and vigor given to the plants, to say nothing about the weeds. If the plantation is small, the work may be done with a garden rake; if large, with a one-horse cultivator, or perhaps better, with a fine toothed one-horse harrow. If this is attended to thoroughly through autumn, the plantation may be mulched at the beginning of winter with straw. It will be better, especially for heavy soils, to remove the mulching in spring and mellow the surface one or more times before the plants blossom. This may be done by

raking the mulch into every alternate row, and then, after the denuded spaces are stirred, to rake it back again and do the other rows. The mulch being replaced by flowering time, the berries will be kept clean. Some cultivators, who have small plantations, do not disturb the mulch in spring, but loosen the soil through it with a pronged hoe—but whatever course is adopted, see that the weeds do not grow.

Strawberry Runners.—The formation of runners exhausts and checks the plants more than a dense mass of weeds. If you wish them to become strong, and bear large, excellent fruit, and plenty of it, keep the runners cut off, and repeat the operation once a week through the summer. Begin the work as soon as the plants *begin* to form runners, and not after they have sent them out in profusion—which is usually immediately after bearing time. If intended for increase, and to form new beds, a small portion of the bed may be permitted to run and root. Some varieties will often bear profusely for a single season, even when the plants run thickly together; others, and more particularly the larger sorts, must be cleared of runners and kept well cultivated, or they will bear small crops.

Strawberries are injured in winter by severe winds, and by the successive heaving of freezing and thawing. They will always start earlier and fresher when covered. Sometimes snow will be an ample protection, but it must not be relied on. A thin coating of straw, evergreen boughs or even cornstalks, will shield and protect the surface of the ground, but it should not be applied till winter is close at hand, and after the ground is frozen hard is not too late. Do not forget to loosen up this mulching very early the next spring, and stir and mellow the soil.

Early Strawberries.—The following method has been successfully tried in some places: Cover a good, well managed, clean bed of strawberries, the runners of which have been kept off, so as to form large vigorous stools, with dry forest leaves early in winter, three or four inches thick. Remove these leaves in February in the Middle States, and in March in the North, and place over the plants a frame with sash. Bank the sides with leaves, and cover the sash in severe weather. The plants will start early, and give ripe fruit at the usual blooming time. Airing and water must not be neglected.

For garden culture it is most convenient to provide beds about five and a half feet wide, with walks or alleys two feet wide between them. Four rows are then set in each bed, a foot and a half

apart, and the outer six inches from the edges of the bed, as shown in this diagram :

ALLEY.

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ALLEY.

The plants may be about a foot apart in the rows. This arrangement allows the picking of the berries from the alleys on each side without treading on the beds, the distance to the second or inner rows being only two feet. If the ground is more limited, beds two feet and a half wide may be made and but two rows planted, as in the diagram below :

ALLEY.

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ALLEY.

In setting out strawberry plants, the following rules may be observed : 1. Use well rooted one year plants. 2. Make the rows straight and parallel by a stretched cord. 3. Take up in a moist time if practicable. 4. In a dry time water the plants well before taking up. 5. Dip the roots in thin mud before setting. 6. If watered after setting, finish by drawing on mellow surface earth, and avoid covering the crown. 7. Plants set at midsummer should have the surface about them covered with fine manure an inch deep to keep it moist and prevent crusting.

SELECTION OF VARIETIES.—Independently of fine quality, the selection of suitable varieties is of great importance. Some sorts, celebrated and highly recommended, will not yield a tenth part of the crop afforded by others. The most productive, among which the Wilson is conspicuous, have yielded at the rate of one hundred,

and often two hundred bushels per acre; the ground, at the period of ripening, glowing with the dense red clusters which nearly cover the surface; while on some foreign varieties the fruit is so thinly scattered and imperfect, that whole square feet are destitute of fine specimens.

Staminate and Pistillate Sorts.

As the productive qualities of strawberries depend so essentially on the presence of the *stamens* and *pistils*, some attention to this part of the subject becomes indispensable to their succcessful culture.

Modern cultivators divide all strawberries into two distinct classes, one being termed *staminate* (or "male"), in which the stamens are fully developed, and possess the power of fertilizing the germ; and the other being termed *pistillate* (or "female"), in which the stamens are abortive, or so small and imperfectly developed that they fail to accomplish fertilization. Figs. 453 and 454 represent the usual appearance of these two kinds of

Fig. 453. *Staminate flowers.*

Fig. 454. *Pistillate flowers.*

Fig. 455. *Pistillate flower, magnified.*

Fig. 456. *Staminate flower, magnified.*

flowers; and Figs. 455 and 456, magnified portions of the same, Fig. 456 exhibiting a part of the flower of the Large Early Scarlet, and Fig. 455 the same of Hovey's Seedling; *a*, being the stamens, and *b*, the pistils. By the use of a microscope it will be found that the former is abundantly supplied with pollen or fertilizing dust, while the latter is nearly or totally destitute. Hence Hovey's Seedling, or any other pistillate variety, can never, or but very imperfectly, fertilize its own flowers, and the impregnation must be derived from a staminate sort.

In planting strawberry beds, it is important, therefore, to know the character of the flowers. Nothing is easier than to distinguish the two when in blossom. This distinction is given in the *arrangement of varieties* which follows. About one-quarter staminates are usually regarded as abundant for fertilizing a bed of pistillates. To prevent intermixture of the two sorts by runners, they may be planted in alternate strips, as indicated by the following diagram, S representing staminate, and P pistillate varieties :

P	P	P	P		S		P	P	P	P		S		P	P	P	P		S S S S
P	P	P	P		S		P	P	P	P		S		P	P	P	P		S S S S
P	P	P	P		S		P	P	P	P		S		P	P	P	P		S S S S
P	P	P	P	*Path.*	S	*Path.*	P	P	P	P	*Path.*	S	*Path.*	P	P	P	P	*Path.*	S S S S
P	P	P	P		S		P	P	P	P		S		P	P	P	P		S S S S
P	P	P	P		S		P	P	P	P		S		P	P	P	P		S S S S
P	P	P	P		S		P	P	P	P		S		P	P	P	P		S S S S

In selecting two varieties for this purpose, perfect fertilization requires that their season of flowering should be nearly at the same time. Hence early and late flowering sorts will not succeed well together for this purpose. Nearly all sorts most commonly cultivated at the present time are staminate, and do not require this arrangement of beds for fertilization.

VARIETIES.

ARRANGEMENT.

Class I. Scarlet and Pine Strawberries.

(Scarlet strawberries have small flowers ; leaves rather long, thin and light green, sharply serrate ; fruit bright color, acid or sub-acid, seed deeply sunk. (*Fragaria virginiana.*) Pine strawberries are characterized by rather large flowers, leaves broad, dark green, sometimes obtuse ; fruit large, not acid, rather smooth, seeds little sunk. (*Fragaria grandiflora.*) These two sorts have been much hydridized and crossed, until it is now difficult to assign many varieties to either separately.)

Section I. Flowers staminate.
Section II. Flowers pistillate.

Class II. Alpine and Wood Strawberries.

(Flowers rather small, perfect; leaves small, thin, light green; fruit small, sweet, parting freely from the calyx. *Fragaria vesca.*)

Class III. Hautbois Strawberries.

(Leaves large, pale green, on tall stalks; fruit-stalk tall and erect; fruit dull purplish. *Fragaria elatior.*)

Class IV. Chili Strawberries.

(Leaves very hairy, thick, obtusely serrate; fruit very large, pale, insipid. Tender. *Fragaria chilensis.*)

Class V. Green Strawberries.

(Leaves light green, plaited; flesh solid. Of little value.)

Class I. Scarlet and Pine Strawberries.

Section I. Flowers staminate.

Agriculturist. Very large, nearly conical, sometimes coxcombed, somewhat necked; deep scarlet; flesh firm, of a pleasant, moderately good flavor. A strong grower. N. J. Fails in many localities.

Alice Maude. Large, conical, dark glossy scarlet; juicy, rich, excellent. Plant strong, vigorous—requires deep and rich cultivation. Foreign.

Austin Shaker. (Austin, Shakers' Seedling.) Very large, roundish, light red; soft, usually hollow, of moderate or poor flavor. Productive.

Barnes' Mammoth. Large, roundish conical, dark crimson; subacid, good. An uncertain bearer. Poughkeepsie, N. Y.

Black Defiance. Large, deep red, roundish conical; flesh firm, season medium. New—of high promise.

Boston Pine. (Bartlett.) Large, roundish, very slightly conical, regular; deep red; flesh pale scarlet, solid, rich flavored, hardy. Often productive. Needs a fertile soil, and cultivation in "hills" or rows. Early. Fails entirely when allowed to cover the bed.

Brighton Pine. Large, conical; deep crimson, with a rich, sub-acid flavor. Early, hardy, sometimes productive—often a poor bearer.

British Queen (Myatt's). Very large, roundish, sometimes cox-comb-shaped; color rich scarlet; flesh rich, tender, rather early. A poor bearer, and hence unworthy of cultivation. In England, productive and superb.

Brooklyn Scarlet. Medium or large, long, conical, necked; sweet, flavor excellent. Productive. By some regarded the best of the famous "Tribune Strawberries."

CHARLES DOWNING. Rather large, ovate-conical, regular; color deep scarlet; flesh firm, juicy, rich. Plant vigorous and productive. Valuable in nearly all localities. Raised by J. S. Downer, Kentucky.

Colonel Ellsworth. Large, roundish, necked, dark crimson; rather firm, flavor moderate, dry. Early, productive. Staminate. One of the three "Tribune" berries. Mostly a failure, and little known.

Cushing. Rather large, roundish conical; light scarlet; flesh tender, pleasant, sprightly, of moderate flavor. Phila.

Cutter, or *Cutter's Seedling.* Medium or large, conical, slightly necked; bright scarlet; soft, sweet, good. Productive.

DOWNER'S PROLIFIC. Medium, roundish ovate; dark red; flesh soft, rather acid, moderately agreeable. Very productive.

French's Seedling. Large, roundish oval, of uniform size; light scarlet, handsome; sweet, very good. Valuable for market. Early. Vigorous, productive.

Genesee. Rather large, roundish, somewhat oblate, generally necked; scarlet inclining to crimson; tender, juicy, mild, pleasant. Hardy, vigorous. Rochester, N. Y. Mostly superseded.

Georgia Mammoth. Medium, conical; dark crimson; firm, acid. Productive—valuable for its lateness.

Goliath. (Kitley's Goliath.) Large, irregular; scarlet; rich, high flavor. Requires much room and high culture. English.

Hathaway. Large, roundish oblong, deep scarlet; flavor rich, acid. Plant vigorous and productive. Michigan.

Hooker. Large, broadly conical, regular, large specimens cox-comb-shaped; dark crimson; rather tender, juicy, with a fine, rich flavor. An excellent sort, but rather tender, requiring winter covering, and for this reason is passing out of cultivation.

Iowa. (Washington.) Rather large, roundish; light orange scarlet; tender, juicy, very acid. Early. Hardy and vigorous. Western.

JENNY LIND. Medium, conical, rich glossy crimson; firm, juicy, rich sub-acid. Mass. A valuable very early sort.

Fig. 457.—*Hooker Strawberry.*

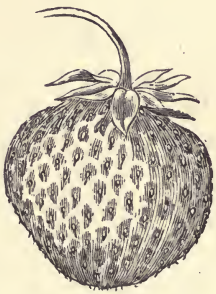

Fig. 458.—*Iowa.*

JUCUNDA. Large, conical, rarely coxcombed; glossy, brilliant scarlet; seeds prominent; flesh white, with pale salmon centre, firm, juicy, of moderate quality—often poor. A profuse bearer on some soils, and valuable for market, bearing long conveyance. Rather tender. Late.

Fig. 459.—*Jucunda.*

Keene's Seedling. Large, roundish oblate, often coxcomb-shaped, shining, dark purplish scarlet; firm, rich, high flavored. Rather early. Of the highest reputation in England, but tender, unproductive, and nearly valueless here.

Kentucky. Large, roundish conical, dark red; moderately firm; slightly acid, rich; good. Plant vigorous, with strong fruit-stalks; productive. Valuable for its lateness. New.

La Constante. Large, handsome, crimson; juicy, sweet, high flavored. A fine strawberry, but of moderate productiveness, and not adapted to general cultivation.

Fig. 460.—*Large Early Scarlet.*

Large Early Scarlet. Medium, roundish ovate, regular; bright scarlet; tender, rich, excellent. Very early. Productive at the North.

The Old or Virginia Scarlet, the original wild strawberry of this country, is smaller, and three or four days later.

Le Baron. Large, obtuse conic, dark scarlet; sweet, rich, melting. Productive. L. I. Little known.

Lennig's White. Large, ovate conical, whitish tinged with red; flesh soft, tender, juicy, with a rich pineapple flavor. Delicious in quality, but a poor bearer. Pa.

LONGWORTH'S PROLIFIC. Large, roundish, broad at base; light crimson; flesh scarlet, firm, rich, brisk, acid. Vines vigorous, productive. Cincinnati. Valuable at the South and West.

Matilda. Large, conical, uniform, scarlet, firm—of excellent quality. Plant a strong grower, and very productive. New. Ulster Co., N.Y.

Monarch of the West. Very large, bright red, showy, firm; of moderate quality. Very productive. N. J.

Monitor. Quite large, roundish; bright scarlet; firm, good. Vigorous grower. Productive, and perhaps best of the three "Tribune Strawberries."

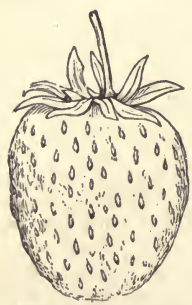

Fig. 461.—*Nicanor.*

NICANOR. Medium, ovate, conical, uniform and regular, scarlet; flesh rather firm, rich and of fine quality. Plant productive and hardy; valuable for its earliness. Raised by Ellwanger & Barry, Rochester, N. Y.

Napoleon III. Large, irregular, conical, sometimes coxcombed, light scarlet; firm, of good quality. Mostly a poor bearer.

PRESIDENT WILDER. Large, ovate-conical, regular, bright scarlet; flesh firm, sweet, rich. Often quite productive. Dorchester, Mass. A European variety, known

as President Wilder, is distinguished from this by the long neck of the fruit.

Ross Phœnix. Large, usually coxcombed or compressed, dark red; flesh firm, of fair flavor. Season medium. Sometimes very productive; but usually fails on heavy clay, and scorches on light gravel. An uncertain variety. Now superseded.

Scott's Seedling. Rather large, elongated conic, regular; light scarlet; flesh pale red, not very juicy nor high flavored. Mass. Superseded.

SETH BOYDEN. (Boyden's No. 30.) Very large, roundish conical, regular, often with a short neck, bright crimson; rather soft on the surface, juicy, rich, sub-acid. Plant vigorous and productive. Newark, N. J.

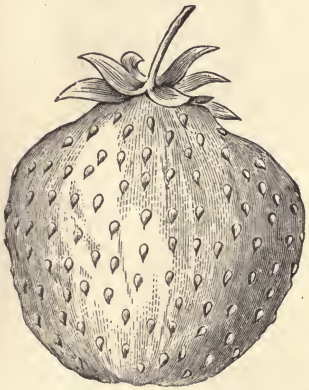

Fig. 462.—*Seth Boyden.*

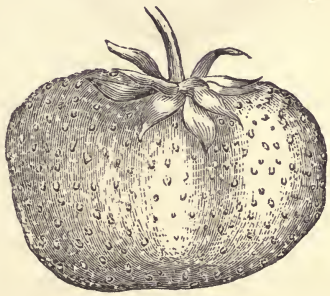

Fig. 463.—*Triomphe de Gand.*

Stinger's Seedling. (Union, *erroneously*.) Large, roundish ovate or coxcomb-shaped; scarlet; stalk stiff. Penn.

TRIOMPHE DE GAND. Quite large (often two inches longest diameter under good cultivation), sometimes irregularly roundish, more frequently much coxcombed; crimson; flesh rather firm, with a mild, sweet, very good flavor. Plant vigorous, hardy, and moderately productive—requiring good cultivation and the removal of runners. Belgian.

Victoria. (Trollope's Victoria, Union.) Very large, nearly round, regular; light red; flesh pale red, tender, moderately rich, juicy, sweet—often nearly flavorless. Plant hardy, moderately vigorous, not very productive. English.

Vicomtesse Hericart de Thury. Rather large, conical, sometimes coxcombed, scarlet; firm, rich. Early and productive. Lobes of the leaves short and roundish, crimped. French.

Walker's Seedling. Rather large, regular, conic; deep glossy crimson, becoming maroon; flesh crimson, tender, juicy, with a fine, rich, brisk flavor. Handsome, excellent, productive. Roxbury, Mass.

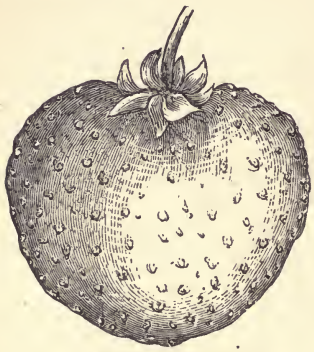

Fig. 464.—*Trollope's Victoria.*

Fig. 465.—*Walker's Seedling.*

WILSON'S ALBANY. (Albany Seedling, Wilson.) Large, broadly conic, pointed; deep crimson; flesh crimson, tender, brisk acid, becoming rich and agreeable when fully ripe. Exceedingly productive and hardy, and succeeds well as a market sort at the North, South, and West.

Section II. Flowers pistillate.

Bishop's Orange. Large, regularly conical; light scarlet, approaching orange; flesh firm, flavor rather acid; growth low; leaves hairy. Superseded.

Black Prince. Large, roundish ovate, often approaching oblate, seeds slightly sunk; flesh firm, with a mild, agreeable, fine flavor. Season medium; hardy, rather productive. Leaves large, flat; petioles quite downy. Variable and unreliable. Superseded.

Burr's New Pine. Medium or large, an inch to an inch and a fourth in diameter, roundish conical, smooth, even, and regular, seeds scarcely sunk; color pale red; flesh whitish pink, very tender, flavor fine. Prolific, and with perfect berries. Formerly very popular; now nearly superseded.

Colonel Cheney. Large, roundish ovate, bright scarlet; flesh rather firm, of fine quality. Sometimes very productive. New.

Crimson Cone. (Dutch Berry.) Medium, uniformly conical; bright crimson, rich, acid. Varies much in productiveness. (Fuller says flowers perfect.)

Fig. 466.—*Wilson's Albany.*

Diadem. Large, round, light scarlet, showy; fine and pleasant. Plant healthy and hardy. L. I. Local.

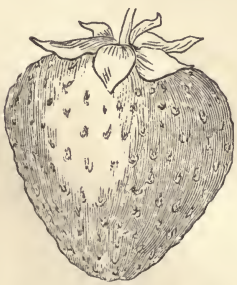

Fig. 467.—*Burr's New Pine.*

Fig. 468.—*Green Prolific.*

Fillmore. (Feast's Fillmore.) Large, of uniform size, dark, glossy; solid, sweet, aromatic—sometimes poor. Often very productive—frequently fails.

GREEN PROLIFIC. Large, roundish, orange scarlet; good, rather acid—valuable. A thrifty grower—productive. N. J.

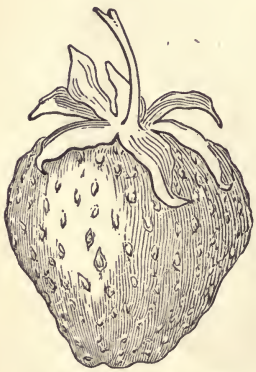

Fig. 469.—*Hovey's Seedling.*

HOVEY'S SEEDLING. Quite large, roundish oval, approaching conical; color deep shining scarlet; seeds slightly sunk; firm, rather rich, good. Very large, showy, productive, and hence fine for market. Season medium. With high culture it has been made very productive. Well known and popular, but partially fails in many localities.

Hudson. (Hudson's Bay, Old Hudson.) Rather large, ovate, usually with a neck, often without, dark rich red; flesh firm, of a high brisk acid flavor, requiring full maturity to be fine. Rather late. Profusely productive. Formerly the great market variety of Cincinnati; now nearly superseded. Valuable for preserving.

Ida. Medium or smallish, nearly round, dark red; flesh firm, slightly acid, good in flavor—quite early and continues till late. Plant vigorous, productive. Fruit-stalks long and erect.

Jenny's Seedling. Large, roundish conical; dark rich red; firm, rich, sprightly sub-acid. Excellent for preserving. Late. Hardy.

MCAVOY'S SUPERIOR. (Buffalo Seeding.) Large, roundish oblate, more or less necked; light crimson becoming deep crimson; flesh scarlet, tender, juicy, very rich, vinous. Tender, and will not bear long carriage. Medium season. Hardy, vigorous, and productive. Ohio.

McAvoy's Extra Red. Large, irregularly oblate, generally necked; color deep scarlet; tender, juicy, acid, not rich. Excellent for preserving. Cincinnati.

Monroe Scarlet. Rather large, roundish; light scarlet; tender, juicy, of good flavor. Rochester, N. Y. Little known.

Moyamensing. Rather large, broadly conical; deep crimson; seeds numerous and deeply imbedded; flesh red, firm, acid. Phila. passing out of favor.

Neck Pine. Large, with a slender neck; color light red; flesh nearly white, rather acid, of fine flavor. Very productive, early—much cultivated at Cincinnati in past years.

Peabody. Quite large, irregular conic and coxcombed; deep crimson; flesh firm, sweet, rich, excellent flavor. Too poor a bearer to be of value. S. C. Hardy at the North.

Pennsylvania. Rather large, broadly conical; deep crimson; flesh red, rather firm, acid. Phila.

Prince's Climax. Large, conical; bright scarlet; good. Productive. Plant vigorous. L. I. Little known.

Rival Hudson (Burr's). Medium, conical; deep crimson; firm, brisk, sub-acid. Hardy and productive. Columbus, Ohio.

RUSSEL. (Russel's Seedling, Russel's Prolific.) Very large, roundish conic, somewhat irregular, slightly necked; bright crimson; slightly acid, rich, very good. Sometimes very fine and productive.

Scarlet Cone. Large, conical; bright scarlet, beautiful. Vigorous and productive. Rochester, N. Y. Little known.

Western Queen. Rather large, roundish conical; rich, glossy dark red; flesh firm, juicy, sub-acid, sprightly, agreeable. Cleveland, Ohio.

Willey. Medium, roundish; deep crimson; firm, sprightly, acid—good for preserving. Resembles Hudson. Improves by hanging long.

CLASS II. ALPINE AND WOOD STRAWBERRIES.

Bush Alpine. The Red and White Bush Alpine resemble the common Alpines in every particular, except in an entire destitution of runners. Hence they grow in compact bunches, and are considered valuable as edging for kitchen garden beds. They are necessarily propagated by dividing the roots. They bear through the whole season, even more uniformly than the common Alpines.

Red Alpine. (Alpine Monthly.) Rather small, long conical; seeds not sunk; color red; quite sweet, mild, not high flavored. Ripens a good crop just after the usual strawberry season, and if damp and shaded on a deep rich soil, through the season till winter frosts. An abundant autumnal crop is secured by clipping the spring blossoms.

The White Alpine is quite similar, except in its light yellowish or nearly white fruit.

Red Wood. Resembles the Alpine in size, flavor, and general appearance, but has rounder fruit, and does not continue so long through the season.

The White Wood only differs in its light-colored fruit.

The Wood Strawberries are of little value.

The Alpine and Wood Strawberries are easily propagated from seed, with very little or no variation.

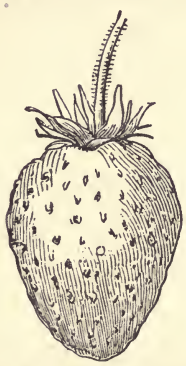

Fig. 470.—*Prolific Hautbois.*

CLASS III. HAUTBOIS STRAWBERRIES.

Belle Bordelaise. Medium, conical, with a fine musky flavor. One of the best of the Hautbois.

Prolific. (Conical Hautbois, Musk Hautbois, Double Bearing.) Large, long ovate conical; light purple becoming dark purplish red; surface slightly irregular; seeds projecting; much esteemed by some for its rich, fine musky flavor, and disliked by others.

The CHILI and GREEN STRAWBERRIES appear to be unworthy of cultivation. Of the former, *Wilmot's Superb*, a very showy, large, roundish or cockscombed fruit, with a pale red surface, and hollow insipid flesh, has excited the most attention.

COMPARATIVE TIMES OF RIPENING.

The following list of most of the popular strawberries exhibits at a glance their comparative periods of ripening, the earliest being placed at the left and the rest successively to the right.

Large Early Scarlet.
Jenny Lind.....
Nicanor.....
Wilson.....
Downer's Prolific...
Ida.....
Green Prolific.....
Chas. Downing.....
Hovey's Seedling....
Agriculturist.....
Longworth.....
Seth Boyden.....
Triomphe de Gand..
Jucunda.....
Kentucky .....

CHAPTRER X.

THE CURRANT AND GOOSEBERRY.

THE CURRANT, from its hardiness, free growth, easy culture, great and uniform productiveness, pleasant flavor, and early ripening, is one of the most valuable of our summer fruits.

It is propagated, like the gooseberry, from cuttings, for which vigorous shoots of the last year's production should be chosen. As soon as the leaves ripen, cut off the new growth and make cuttings about six inches long. Set them in rows fifteen inches apart and two inches in the rows. Just as winter sets in, cover them over with coarse litter—taking it off in spring, and keeping them well hoed, and by fall they will have large fine roots. Half the buds only at the top of the shoot, should be left; and the plants may be kept trained up to a single stem, a few inches high, when the branches should radiate on all sides in an upward direction so as to form a handsome spreading top. Currant bushes, if permitted to sucker moderately, will, however, endure for a longer time, as the new shoots, sending out roots of their own, afford, in fact, a spontaneous renewal. But care is needed that they do not form too dense a growth.

The currant being one of the hardiest and most certain fruit-producing bushes, is, for this reason, badly neglected. Good cultivation and pruning will more than triple the size of the fruit. Old bushes should have the old and stunted wood cut out, and thrifty shoots left at regular distances. Old manure should be spaded in about the roots, and the soil kept clean, cultivated, and mellow. As the currant starts and expands its leaves very early, this work should be performed as soon as the frost leaves the soil. A resident in Canada says that the best currants he ever had, produced in great abundance, were obtained in a dry season, by covering the whole surface of the ground with cow manure as a mulch, three inches thick. On looking under, the soil was always moist. Heavy pruning must follow the luxuriant growth thus produced.

The different varieties of the CURRANT succeed nearly alike in the Northern, Middle and Western, but fail in the Southern States.

PRUNING THE GOOSEBERRY AND CURRANT. In the culture of the gooseberry and currant three distinct modes are adopted. The first, which is quite common in this country, is to plant the bushes along garden fences, where they often grow up with grass, and being neither cultivated nor cared for, the fruit becomes small and of little value. This is the worst mode.

The next is to cultivate, but not to prune. The fruit on such bushes is fine while they are young, but as they become filled with a profusion of old bearing wood it diminishes in size.

The third and best mode is to give them good, clean cultivation, and to keep up a constant supply of young bearing wood, yielding large and excellent crops.

The currant and gooseberry, like the cherry, bear their fruit on shoots two or more years old; and it is important that a succession of strong young shoots be maintained for this purpose. The branches of the heads should therefore be distributed at equal distances, and the old bearing spurs cut out when they become too thick or enfeebled, and new shoots allowed successively to take their place.

When a young gooseberry or currant bush is set out, all the buds or suckers below the surface of the ground should be previously cut off clean, so as to form a clear stem. It is often recommended that this stem be a foot high before branching—which does well for the moist climate of England; but under our hot suns it is better that the branches begin near the surface of the ground.

Old currant bushes, such as have grown up to a thick mass, may be greatly improved, and will increase the fruit several times in size, by thinning out clean all the old crooked wood, and leaving a sufficient number of young stems at equal distances, to bear the future crop.

The English gooseberry, in this country, will remain free from mildew only so long as it is kept in a vigorous growing condition by frequent and judicious pruning, so as to give a constant succession of strong shoots.

CLASS I. *Red and White Currants* (*Ribes rubrum*).

Attractor. Large, very white, handsome, strong grower and productive. French.

CHERRY CURRANT. Very large, nearly twice the size of the common Red Dutch, often five-eighths of an inch in diameter; round, dark red, clusters moderately short, quite acid. Growth large, tall and luxuriant. Sometimes unproductive. Italy. The flavor is improved by hanging long.

Gondoin Red. Large, growth vigorous. The leaves and fruit hang long. It proves of good quality by the first of September. Much earlier, it is sour and unpalatable.

Gondoin White. Fruit large, whitish yellow, less acid than most other sorts, of excellent quality. A strong grower and productive.

Fig. 471.—*Cherry Currant.*

Fig. 471 *a.*—*Paluau* (?)

Knight's Large Red. Large, red, bunches quite long; resembling Red Dutch. Productive. Requires high cultivation to develop its good qualities.

Knight's Sweet Red. Size of berries moderate, or nearly as large as Red Dutch—lighter colored than the latter and slightly less acid. This is not a sweet currant, and is rather more acid than White Dutch.

PALUAU. (Fertile Currant of Paluau.) Large, dark red. Productive, nearly the size of the Cherry Currant. French. New.

PRINCE ALBERT. Large, light red, ripens quite late. Growth strong, productive.

RED DUTCH. A little larger than the common old red currant, and clusters much longer, and a little less acid.

Transparent. Large, yellowish white, very productive ; resembles white Dutch, but larger.

VERSAILLAISE. (La Versaillaise.) Large, closely resembles Cherry Currant, but slightly less acid ; deep red, bunches long. Productive, valuable. French. New. La Fertile and La Hative, scarcely differ from Versaillaise.

VICTORIA. (May's Victoria, Goliath.) Fruit rather large (a little larger than Red Dutch); red, bunches very long, ripens rather late and hangs long. Growth strong, spreading. Requires high cultivation to give full size to the bunches.

WHITE DUTCH. Full medium in size, yellowish white, bunches rather long ; less acid than Red Dutch and other red currants. Dana's White is nearly identical.

WHITE GRAPE. Large (rather larger than White Dutch); bunches rather short, quality excellent. Growth spreading and moderately vigorous.

CLASS II. *Black Currants* (*Ribes nigrum*).

Black Naples. Large (sometimes five-eighths of an inch in diameter), black ; bunches small, with a strong musky flavor. A coarse grower. The best of the black currants.

Common Black or *Black English.* Large, one-third of an inch in diameter, quite black, clusters very short ; with a strong odor, flavor poor.

THE GOOSEBERRY.

VARIETIES.

Of the English gooseberries many hundreds have been named and described, and large numbers have been imported and tried in this country, but they generally mildew and become worthless after bearing a year or two, although the bearing may be prolonged by high culture, mulching, and free pruning. Among those which have succeeded best, a few are selected below.

Crown Bob. (Mêlling's Crown Bob.) Large, often an inch and a fourth long, roundish-oval, red, hairy, flavor of first quality ; branches spreading or drooping.

Parkinson's Laurel. Large, obovate, green, downy, flavor of first quality; branches rather erect.

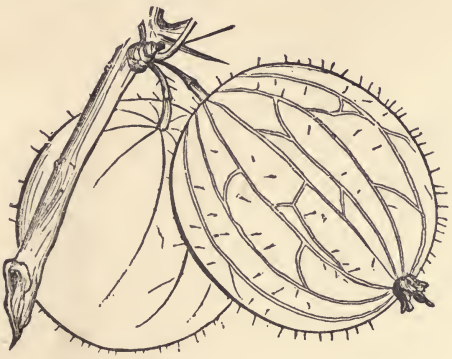

Fig. 472.—*Crown Bob.*

Red Warrington. Rather large, roundish-oblong, hairy; flavor of first quality. Hangs long without cracking, and improves in flavor. Branches drooping.

Fig. 473.—*Whitesmith.*

Roaring Lion. (Farrow's Roaring Lion.) Very large, oblong-oval, red, smooth; flavor fine; hangs long; branches drooping.

Wellington's Glory. Large, oval, very downy, skin quite thin; flavor excellent; branches erect.

Whitesmith. (Woodward's Whitesmith.) Rather large, a little over an inch long, roundish-oval, slightly approaching oblong, yellowish white, very slightly downy, flavor of first quality; branches rather erect.

AMERICAN VARIETIES.

Fig. 474.—*Downing.*

Fig. 475.—*Smith's Improved.*

DOWNING. (Downing's Seedling.) Medium or rather large, oval, pale green, very good; bush upright, productive. Larger than Houghton. Bush of strong, heavy growth, very spiny.

Fig. 476.—*Houghton's Seedling.*

HOUGHTON'S SEEDLING. Fruit small, oval, commonly about three-fourths of an inch long; skin smooth, thin, glossy, a pale,

dull reddish brown, marked with faint greenish lines; flesh tender, juicy, sweet, pleasant. Ripens soon after midsummer. Not high flavored, as compared with the best European sorts, but a profuse bearer, free of mildew, and of very easy cultivation. A seedling from a wild American species. Origin, Salem, Mass.

Mountain Seedling. This sort resembles the Houghton in color, but is mostly larger in size, has a thicker skin, and is slightly inferior in quality. Bush strong and upright.

Pale Red. Rather small, or size of Houghton, but darker in color when fully ripe.

Smith's Improved. Larger than Houghton, light or yellowish green, excellent in quality. Bush of moderate growth. New.

CHAPTER XI.

THE RASPBERRY AND BLACKBERRY.

THE RASPBERRY.

PROPAGATION. The varieties which have originated from the foreign species (*Rubus Idæus*) are increased with great facility by suckers; but plants with better roots may be obtained by planting under glass, with a mild bottom heat, cuttings of the roots an inch or more in length. The American Black Cap and its varieties (*Rubus occidentalis*) are propagated readily by layers, the tips of the recurved branches when slightly buried, soon taking root. This layering may be done in August or September, the tips of the shoots having been nipped about midsummer, and when these branch and form tips bare of leaves, bury them in the soil at an angle of 45 degrees, and they will form fine roots before winter. New varieties are raised from seeds, and come into bearing the second year.

The soil for the raspberry should be rich, and an admixture of swamp muck is useful. A strong deep loam is the only soil from which a full crop may be expected every season. If sandy or gravelly, or a stiff, cold clay, it cannot be relied upon. But the most important requisite is *depth*, only to be attained by deep ploughing or trenching, which will go far towards affording a remedy for any natural defect of the soil. The more tender varieties may be raised on higher, drier, and firmer spots of ground, where they are less liable to severe frosts.

The stems of the raspberry are biennial, the canes growing the first season and bearing fruit the second, after which they die, and the new ones take their places. As soon as growth ceases and the leaves drop, the old canes should therefore be cut away. When the new canes have reached a sufficient height the following summer, the tips should be pinched off, to prevent their growing taller, which will cause them to become stout and thick, and to send out side shoots, which in turn should also be pinched back when they

have grown a foot or so in length, being shorter above and longer below. With the Cap varieties they should not be more than two and a half feet high, which will obviate the necessity of staking. The Antwerps may be pinched back at three or four feet, but usually this is omitted, in which case they need stakes. The height should vary with the vigor of the plant, strong plants requiring more height. When suckers are numerous they must be cut away when they first appear at the surface, or they will enfeeble the plants, Four or five canes are enough to leave for each stool. The Antwerps and their varieties require the support of staking—which may be effected as shown in fig. 477, or by means of wires stretched between stakes as in fig. 478.

In many parts of the Northern States, some tender varieties need winter protection. This is easily given, by covering the stems, when prostrate, very thinly with earth; placing a small mound of earth against the bottom of the stems before laying them down, to bend upon and prevent breaking. This covering is re-

Fig. 477.

Fig. 478.

moved early in spring. It will be found to prove very useful, even when not necessary to prevent winter-killing, by rendering the crop larger and more certain.

A plantation of raspberries will continue in bearing five or six years, when it should be renewed. If it remain longer, the fruit becomes small, and the crop gradually declines. Nearly the same varieties succeed in the different States of the Union. The foreign or Antwerp raspberries are worthless in most places south.

Planting for Market.

Wm. Parry, who cultivates extensive plantations of the raspberry near Philadelphia, gives the following directions for their management:

"Plow and prepare the ground as for potatoes or other crops; mark the rows six feet apart, and set the plants three feet distant in the rows, requiring about 2,500 plants to the acre. The tops should be cut down to within a few inches of the ground, that the roots

may become well established before they are required to supply nourishment for long tops of green foliage. Carrots or potatoes may, with advantage, be grown between the rows the first year, after which the raspberries will require the whole space. Stir the ground frequently with horse and cultivator, to keep down grass and weeds, being careful during the warm, dry weather not to disturb the small roots feeding near the surface, by deep culture near to the plants. The raspberries should be carefully picked in small baskets not larger than pints, better less. Both baskets and crates should be ventilated, so as to allow the circulation of air to absorb the heat and moisture, as they will bear transportation to market much better when cool and dry."

Good raspberry plantations will yield at the rate of fifty or sixty, and sometimes a hundred bushels per acre.

Propagating by Seed,

To produce new varieties, is easily performed by washing the ripe seed from the pulp, mixing with damp sand, and sowing in autumn in fine soil, about half an inch deep, covering till early spring with a moderate coat of leaves or litter. They will produce young plants which may be taken up and heeled-in late in autumn, and set out the second spring, after cutting down closely. The second and third year they will begin to bear and to exhibit the characteristics of the new sorts.

Rules for the Culture of Raspberries.

1. Any good strong mellow soil, that will raise good corn, and which has been deeply pulverized, will raise good raspberries.
2. Set the plants in rows that will admit of free cultivating, say five or six feet one way and two or three feet the other.
3. For black-caps, pinch back early, or when the young canes are about two feet high, to keep the bushes snug and compact, and to obviate staking.
4. As the canes grow in one season and bear the next, cut the bearing canes away as soon as they drop their leaves, or never defer the work later than early the succeeding spring.
5. Suckering sorts, to bear well, must have the suckers hoed away when they first appear above ground, or be treated like weeds.
6. Increase the crop by clean mellow culture, and if practicable, by mulching for winter as well as for summer.

Most of the cultivated sorts of the Raspberry are varieties derived from three species of the genus RUBUS. The Antwerps and others resembling them, are varieties of *Rubus Idæus*, the European Garden raspberry, which is distinguished by the stems being mostly rather tall and nearly erect, beset more or less with straight slender prickles, many of which are mere bristles; and the plants increase by suckers. Most of these are rather tender. The Black-cap raspberries are varieties of *Rubus occidentalis*, an American species, the stems of which are armed with hooked prickles, but not with bristles, and are recurved so as to reach and take root at the tips, which touch or are buried in the ground. A few sorts are varieties of *Rubus strigosus*, or Wild Red Raspberry, which has upright stems, copiously furnished with bristles. The canes increase by suckers, and are quite hardy. A few cultivated sorts appear to be hybrids between some of these species.

I. DESCRIPTIONS OF VARIETIES

derived from the foreign species.

BELLE DE FONTENAY. Large, long conical, purplish red, with a thin bloom; moderately firm, sub-acid, good. Canes stout, branching, suckering freely; hardy, and if kept clear of suckers, productive—bearing in autumn under favorable circumstances. French. Worthless in some localities.

BELLE DE PALUAU. Large, roundish conical, regular, bright crimson, moderately firm, juicy, very good; canes strong, upright, very productive; spines short, purple. Requires winter protection. French.

CLARKE. Large, roundish conical, light crimson, rather soft, juicy, sweet, high flavored. Berries sometimes imperfect. Canes stout and branching, leaves large. Hardy, and succeeds on light soils. Suckers very freely. Productive. Origin, New Haven, Conn.

Col. Wilder. Large, roundish conical, yellowish white or cream-colored, slightly translucent, good, rather soft. Canes strong, spines white. Philadelphia, Dr. Brinckle.

FASTOLFF. Large, obtuse conical, approaching roundish, bright purplish red; rather soft, high flavored.—Canes strong, nearly erect, branching, productive. English. Excellent for home use; too soft for ditsant market.

Fillbasket, or *Northumberland Fillbasket.* Rather large, roundish, deep red, pleasant sub-acid, moderately good. Very bristly or spiny. English.

Fig. 479.—*Clarke.*

Fig. 480.—*Col. Wilder.* (Large specimen.)

FRANCONIA. Large, obtuse conical, dark red, firm, with a rich sub-acid flavor. Canes strong, branching and spreading, moderately hardy, productive. A valuable market sort. French. *Naomi* closely resembles Franconia, and by many is supposed to be identical.

Fig. 481.—*Hornet.*

French. (Vice-president French.) Medium or rather large, roundish, crimson ; firm, sweet or mild, very good. Productive and valuable. Philadelphia, Dr. Brinckle.

Hornet. Quite large, ovate conical or roundish, firm, sub-acid, good. Canes strong, fruit-stems long. Productive.

HUDSON RIVER ANTWERP. Large, oblong conical, red, firm, with a very good flavor. Cultivated with great success in Ulster county on the Hudson, but rarely succeeds in other localities. Requires winter covering. Origin unknown, but supposed to have been imported. Distinct from Red Antwerp, or Old Red Antwerp, which has nearly round berries.

Fig. 482.—*Franconia.*

KNEVETT'S GIANT. Quite large, rounded conical, deep red; flesh rather firm, adhering partly to the stalk. Canes strong, erect, spines few. Moderately hardy, productive. English.

Fig. 483.—*Hudson River Antwerp.*

Large-fruited Monthly. Medium or rather large, roundish, crimson; soft, sweet, juicy, of good quality. English.

Marvel of the Four Seasons. (Merveille des Quatre Saisons, October Red.) Medium, roundish conical, bright red; rather soft, juicy, sweet, rich. Canes hardy, suckering profusely, spines or bristles short, purple. Under favorable circumstances bears till mid-autumn. French.

Orange. (Brinckle's Orange.) Fruit large, nearly conical, clear orange yellow, soft, juicy, sweet, rich, of excellent quality. Canes strong, branched, nearly hardy, very productive. The best of the yellow raspberries. Philadelphia.

II. Black-Caps and their Varieties.

(*Rooting at the tips of the Canes.*)

American Black-cap. The common Black-cap, with its many variations, growing wild throughout the country, distinguished by its long recurved canes, and its regular, nearly round, or hemispherical berries, is the type of this division.

Catawissa. Hardly medium, rather flat, purplish red, with a thick bloom, sub-acid. Canes rather tender, producing a second crop in autumn. Cutting down the whole stool in spring causes the canes to bear till late in autumn. Valuable only for the garden. Pennsylvania.

Davison's Thornless. Medium in size, resembling the American Black-cap, but a week earlier, sweeter, and with canes nearly free from prickles. Gowanda, N. Y.

Doolittle. (Joslyn's Improved, Improved Black-cap.) Full medium in size, black, sweet; a large variety of the wild Black Raspberry. Ripens early. Canes strong, with numerous prickles, productive. Has been extensively cultivated for market in many of the States. Ontario Co., N. Y.

Ellisdale. Rather large, dark dull red, flavor good; canes strong and vigorous.

Ganargua. Large, full and well rounded, reddish purple, sub-acid, of good flavor. Canes very strong and vigorous, very prickly, bearing large crops, which ripen for several weeks. Ontario Co., N. Y. New.

Golden Cap. Resembles the American Black-cap, except in the yellow color of its fruit. But little cultivated.

Golden Thornless. Quite large, dull yellow, firm, of moderate quality.

MAMMOTH CLUSTER. (McCormick, Large Miami.) Quite large, often four-fifths of an inch in diameter, flavor very good; canes strong, bearing very large crops—rather late. This is the most popular of the Black-cap raspberries, and in the catalogue of the American Pomological Society is recommended in 28 States.

FIG. 484.—*Mammoth Cluster.*

Ohio Everbearing. Resembles the American Black-cap, except that it has the habit of fruiting in autumn.

Ontario. Large, nearly black, with thick whitish bloom, quality good. Rather early. Wayne Co., N. Y.

Purple Cane. Rather small, dark dull red, soft, sweet, good. Canes long and strong, recurved. Resembles the Black-caps in rooting at the tips of the canes, but differing in the character of the fruit. An old and popular variety, becoming superseded.

Seneca Black-cap. Rather large, dark shining purplish black, very good in quality. Season medium. Canes vigorous and productive. One of the best of the Black-caps.

III. Hardy Red Raspberries.

(*Rubus Strigosus, and its variations. Suckering, but not rooting at the tips of the canes.*)

Allen. Two or three sorts with this name were disseminated by L. F. Allen, of Black Rock, N. Y. The canes are strong, erect, very hardy, and sucker profusely. When kept free from suckers, they have produced good crops in some localities, of medium-sized, red, pleasant fruit.

Brandywine. Rather large, bright scarlet, handsome; flesh firm, of good quality. A very popular and profitable market sort in New Jersey and elsewhere. Canes low, and of a stout dwarf habit.

Herstine. Large, oblong conic, bright crimson, flesh rather soft, quality very good. Canes strong, light green, spines few. Very productive. A new sort of high promise. Philadelphia.

Fig. 485.—*Herstine.*

Kirtland. Medium, nearly round, red, moderately firm, sweet; canes erect, nearly smooth, becoming pale red, suckering freely, hardy, productive, early. Fails in some localities.

Pearl. (Susqueco.) Medium, bright red, firm, of good quality. Canes low and of a dwarf habit, resembling those of Brandywine, but the foliage comes out a week later in spring. A popular market sort near Philadelphia.

PHILADELPHIA. Medium in size, nearly round, dark red, moderately firm, subacid, of good but not rich flavor. Canes erect, branching, reddish purple, with a few small spines, suckering moderately, bearing profuse crops. The hardiness, easy culture, and extraordinary productiveness of this variety, have rendered it popular at the east, west, and in portions of the south.

Fig. 486.—*Philadelphia.*

Saunders. Rather large, bright red, quality good. New. Philadelphia.

THE BLACKBERRY.

THE Blackberry requires nearly the same treatment as the Raspberry; but being a more rampant grower it should have more room, and needs more pruning or pinching. The distances of the rows may be six to eight feet apart, and the plants, if kept single, two feet in the row. Sometimes they are allowed to grow thickly or in a continuous line, in which case they should be kept well cultivated and properly pruned.

Constant cultivation is always better than much manuring.

Fig. 487.

Fig. 488.

Pruning the blackberry is commonly but little understood. We hear complaints of the rambling and straggling growth of this bush, extending across alleys, tearing dresses, at the same time prov-

ing unproductive. This is owing to a neglect of summer pruning. As soon as the new shoots have reached two and a half or three feet in height, the ends should be pinched off with the thumb and finger, which will cause the protrusion of laterals. These in turn are to be pinched off when they have grown from twelve to eighteen inches. It will be necessary to pass along the rows every two weeks in doing this work, as new shoots will be constantly thrown out during the entire summer. The plants being thus kept within bounds, will present the neat, compact, and productive bushes shown in Fig. 487, instead of the unproductive stragglers, if left untouched, represented by Fig. 488.

COVERING BLACKBERRIES. The following mode of covering is described in the *Country Gentleman*, by Amos Fish, of Bethlehem, N. Y., and is adapted to cold regions :

"At the approach of winter remove the stakes and lay the bushes at right angles from the rows, flat on the ground, and cover them two or three inches deep with earth, as follows :—Cut off the limbs within one and a half inches of the canes, at the right and left hand sides of the row, making flat bushes. 'Shorten-in' the remaining limbs by cutting off the slender ends ; then, with a digging or dung fork, loosen the earth about the roots, and remove some, laying the roots loose on one side, so that in laying down the roots shall be bent instead of the canes being broken. When laid down use bricks to hold them down while covering, and remove the bricks when in the way. The bushes should be raised up and the stakes replaced as early in the spring as the frost is out of the ground, which can be easily done with a fork if the rows are laid down singly instead of lapping over one another."

VARIETIES.

DORCHESTER. Rather large, oblong (sometimes an inch and a fourth long), nearly sweet, color shining black. It bears carriage well. Vigorous, hardy and productive, ripening at the north the first of August. Mass.

KITTATINNY. Large, sometimes an inch and a half long, oblong ovate, glossy black ; flesh moderately firm, nearly sweet, rich, excellent. Canes very vigorous, quite hardy, very productive, ripening at the north early in August. The best family blackberry. The berries become duller in color after picking and less showy in market.

Missouri Mammoth. Large, black, firm, sweet ; hardy, productive. New. Missouri.

Newman's Thornless. Rather large, oval, quality very good. Canes of moderate growth, nearly free from spines. Early August. Sometimes productive, usually not. Ulster Co., N. Y.

Fig. 489.—*Kittatinny.*

Fig. 490.—*Dorchester.*

NEW ROCHELLE. (Lawton.) Large, oblong oval, black, soft and sweet when fully ripe. Middle of August. Canes tender in severe climates. New Rochelle, N. Y.

Fig. 491.—*Wilson's Early.*

WILSON'S EARLY. Very large, oblong oval, black; quality moderate. Canes tender at the north, hardy as far south as Philadelphia, where it is very productive, and the most showy and profitable of all blackberries. Early. N. J.

CHAPTER XII.

THE CRANBERRY.

THE American Cranberry (*Vaccinium macrocarpon*) is much larger than the European (*V. oxycoccus*), and superior in flavor. While growing it is light green, changing to a light or dark red, crimson, or mottled color, as it ripens. It blossoms in June, and the fruit ripens in September and October. The running stems are often several feet in length, the small oblong leaves remaining during winter, on the approach of which they become brown. There are three leading varieties, with various intermediate grades. The Bell cranberry (Fig. 492) is so called from its peculiar form; the Bugle (Fig. 493) somewhat resembles a bugle head; and the Cherry (Fig. 494) is nearly round.

Fig. 492.—*Bell Cranberry.*

The cranberry is successfully cultivated in this country between 38° and 45° north latitude; but its limit may extend further southward in the mountain ranges.

Fig. 493.—*Bugle Cranberry.*

SOIL.

The best soil and situation consist of peat and muck bottoms, coated with pure sand obtained from adjacent banks, and the ground thus prepared to be

capable of being flooded with clear running water at pleasure during winter, and thoroughly drained at other times. Drift soils have proved unsuccessful. Muddy water running over the plants injures them.

In preparing the soil all wood and rubbish must be cleared off, and the surface or "turf" removed with a hoe made for the purpose. It is then provided with drains by clearing out the main water-course, and making parallel open side ditches at regular distances of about two rods. The whole surface is then covered from four to

Fig. 494.—*Cherry Cranberry.*

six inches with pure sand, which is conveyed from the adjacent bank in dump cars, run by hand on portable and movable wooden rail-tracks. An embankment or small dyke surrounds the whole and allows the plantation to be flooded at pleasure.

Setting the plants. After sanding, the plants are set in rows about two feet apart. Some prefer a greater distance, to admit more freely the passage of a horse cultivator. They should be ten or twelve inches in the row.

Flowing should be continued from December to May, and furnishes, among other advantages, protection from insects as well as from early frosts.

The plantation should be carefully kept clear of weeds for the first two or three years, after which, if well managed, the cranberry plants will cover the surface and render this labor comparatively light.

Gathering the fruit is begun in September, and lasts several weeks. Good pickers will gather three bushels a day.

CHAPTER XIII.

The Orange and Fig.

THE ORANGE.

This fruit grows freely and abundantly in Florida, and it may be cultivated to advantage in the Gulf States, southern Texas, and in the warmer portions of California. With some protection, it may be raised in the southern States further north. The tree will bear several degrees of frost, if protected from the sun's rays in thawing. For this purpose temporary sheds are sometimes erected, but a covering of evergreen branches, more or less dense, according to the severity of the climate, would be found more convenient in some localities.

The bitter orange is naturalized in Florida, and being hardier than the cultivated sorts, it may be employed as stocks for budding or grafting. Young orange trees are raised easily from seed sown in spring; the more thrifty seedlings may be budded the same season, and the smaller ones the following year. Or they may be whip-grafted the succeeding spring. They will begin to bear in four or five years.

VARIETIES.

The catalogue of the American Pomological Society recommends for Florida, Mississippi, and Louisiana, the *Brazilian*, *Louisiana Creole*, and *Mandarin*. The latter is small, with a thin rind, and dark orange flesh, which is juicy, rich, and excellent. The *St. Augustine* orange is large and handsome, with a sweet and excellent flavor. The *Maltese* has a thick rind and red pulp, and is usually very good, but sometimes slightly bitter. The *Havana* much resembles the St. Augustine, but is hardly so large and good, and is the most common sort in our market.

THE FIG.

The fig may be raised in open ground without protection in most of the States south of Virginia. In the Middle States it re-

quires more or less protection in winter, for which purpose it is kept as a low bush by means of pruning the branches and roots. As far south as Virginia, the trees are covered with inverted boxes or large barrels, or protected with a mass of evergreen branches; and when this is insufficient, the boxes or barrels (open above and below) are filled among the branches with dry leaves, or small branches or leaves of evergreen trees. At the north, figs may be raised in sheltered situations, the trees to be laid down on the earth for winter protection, and covered with several inches of dry soil, or a dense mass of forest leaves or evergreen boughs. More commonly, however, they are kept in tubs or boxes.

The trees may be propagated by seeds, layers, cuttings, and suckers. As the seeds do not uniformly produce the same sorts, they are to be employed only for obtaining new varieties. In the south, spring cuttings of last year's growth are taken off and set in February; and summer, or green cuttings, in August. If the latter do well they will bear the following year. At the north, the hard-wood cuttings are taken off late in autumn, and kept moist in a cellar till spring, and then set out. The green or summer cuttings, which should be only a few inches long, root best with bottom heat.

The soil should be supplied with a medium amount of moisture. If too dry, the trees will drop their fruit; if too moist, the growth will be too rank and succulent, and the trees bear thin crops.

The fig bears two principal crops, the first in spring, the second towards the end of summer. Novices are puzzled to see the spring figs make their appearance before either leaves or flowers are seen —the explanation of which is, that the fruit is only a fleshy receptacle, the inside of which contains the numerous minute flowers.

VARIETIES.

Among a large number of sorts the following are recommended as desirable:

Angelica. (Angélique.) Medium, obovate, greenish-yellow; flesh white, with red at the centre. Great bearer.

Black Ischia. Medium, dark violet or blue, flesh deep red, very sweet, luscious. Rather hardy and productive.

Brown Ischia. Medium, round-obovate, light-brown, flesh purple, sweet, very good. Rather hardy; great bearer.

Brown Turkey. Medium to large, pyriform, brownish-red; flesh red, of excellent flavor. One of the hardiest, and the most reliable for open culture.

Brunswick. (Madonna.) Very large, pyriform, violet, greenish-yellow in the shade; flesh reddish-brown, flavor rich, excellent. Rather hardy; productive; a strong grower.

Celestial. Very small, violet, sweet; skin thin.

Early Violet. Small, roundish, brownish-red, flesh red, good in quality; hardy and prolific. Recommended for pots and forcing.

SELECT LISTS OF FRUITS.

LIST OF APPLES.

For Maine and similar latitudes east.

Summer.

Sops of Wine.
Red Astrachan.
American Summer Pearmain.
Early Sweet Bough.
Williams' Favorite.
Early Harvest.
Benoni.

Autumn.

Porter.
Gravenstein.
Winthrop Greening.
Autumn Strawberry.
Duchess of Oldenburg.
Fall Orange.

Winter.

Hubbardston Nonsuch.
Baldwin, for warmer parts of the State, or grafted standard height.
Rhode Island Greening, grafted standard height.
Jewett's Red.
Roxbury Russet.
Ribston Pippin.
Tallman Sweet.
Danver's Sweet.
Minister.
Domine.
Fameuse.
Pomme Gris.

M. P. Wilder, President of the American Pomological Society, furnishes the following:

Select list of Apples for Massachusetts.

Best Six Varieties.

Williams.
Early Bough.
Gravenstein.
Hubbardston Nonsuch.
Fameuse.
Baldwin.

BEST TWELVE VARIETIES.

Red Astrachan.
Rhode Island Greening.
Ladies' Sweet
Fameuse.
Baldwin.
Tallman Sweet.
Williams.
Early Bough.
Gravenstein.
Hubbardston Nonsuch.
Porter.

List of Apples for New York and adjacent region.

SUMMER.

Early Harvest.
Red Astrachan.
Early Joe.
Primate.
Sweet Bough.

AUTUMN.

Late Strawberry.
Porter.
Gravenstein.
Munson Sweet.
Duchess of Oldenburg.
Lowell.
Dyer.
Twenty Ounce.

WINTER.

Tompkins Co. King.
Peck's Pleasant.
Fall Pippin.
Westfield Seek-no-further.
Hubbardston Nonsuch.
Golden Russet of Western N. Y.
Yellow Bellflower.
Jonathan.
Rhode Island Greening.
Baldwin.
Roxbury Russet.
Northern Spy.
Wagener.
Swaar.
Tallman Sweet.
Esopus Spitzenburgh.

A vote of the Fruit Growers' Society of Western New York gave the following as the best six varieties for market :

Baldwin
Tompkins Co. King.
Golden Russet of Western N. Y.
Rhode Island Greening.
Roxbury Russet.
Northern Spy.

List for Pennsylvania, Northern Maryland, etc.

SUMMER.

American Summer Pearmain.
Red Astrachan.
Early Harvest.
Summer Rose.
Sweet Bough.
Summer Queen.

AUTUMN.

Fallawater.
Fall Pippin.
Porter.
Maiden's Blush.
Townsend.

WINTER.

Baldwin.
Bullock's Pippin.
Rambo.
Rhode Island Greening.
Roxbury Russet.
Smokehouse.
Wine Apple.

List for Northern Indiana, Illinois, and Northern and Central Ohio.

SUMMER.

Early Harvest.
Carolina Red June.
Benoni.
Early Pennock.
High Top Sweet.
Red Astrachan.
Keswick Codlin.
Hocking.

AUTUMN.

Autumn Strawberry.
Bailey's Sweet.
Dyer.
Duchess of Oldenburg.
Haskell Sweet.
Lowell.
Maiden's Blush.
Ramsdell's Sweet.
Fameuse.
Fall Pippin.
Fulton.
Siberian Crab.
Holland Pippin.
Mother.
Rambo.

WINTER.

Winesap.
Rawle's Janet.
Domine.
Jonathan.
Willow Twig.
Carthouse, or Red Romanite.
Westfield Seek-no-further.
White Winter Pearmain.
Minkler.
Tallman Sweet.
Yellow Bellflower.
Northern Spy.
Roman Stem.
Swaar.
Bullock's Pippin.
Ramsdell's Sweet.

For a small list of sorts that succeed in this region, take—

Red Astrachan.
Carolina Red June.
Early Harvest.
Keswick Codlin.
Maiden's Blush.
Rambo.
Ben Davis.
Yellow Bellflower.
Winesap.

For the more northern parts of this region and Wisconsin, the following have proved quite hardy:

Red Astrachan.
Sops of Wine.
Carolina Red June.
Duchess of Oldenburg.
Early Joe.
Fall Orange.
Fall Wine.
Tallman Sweet.
Tetofsky.
Fameuse.
St. Lawrence.
Wagener.
Pomme Gris.
Golden Russet of Western N. Y.
Carthouse.
Northern Spy.
Wealthy.
Fall Stripe or Saxton.

List for Southern Ohio, Indiana and Illinois, and Kentucky and Missouri.

SUMMER.

Early Harvest.
Red Astrachan.
Carolina Red June.
American Summer Pearmain.
Large Yellow Bough.

AUTUMN.

Maiden's Blush.
Rambo.
Buckingham.

WINTER.

Rawle's Janet.
Ortley.
Yellow Bellflower.
Winesap.
Willow Twig.
Rome Beauty.
Yellow Newtown Pippin.
Michael Henry Pippin.
Newtown Pippin.
Ben Davis.
Pryor's Red.
White Winter Pearmain.
White Pippin.
Jonathan.
Bullock's Pippin.

Apples for Virginia and adjacent regions.

Carolina Red June.
Gravenstein.
Belmont.
Fall Pippin.
Yellow Bellflower.
Smokehouse.
Rambo.
Smith's Cider.
Male Carle.
Maiden's Blush.
Loudon Pippin.
Limber Twig.
Fallawater.
Pryor's Red.

Select List of Twelve Varieties of the Apple, by Joshua Lindly, of North Carolina.

Summer Rose.
Carolina Red June.
Summer Pearmain.
Wilson's Summer (Am. Red Juneating ?).
Magnum Bonum.
Golden Russet.
Clarke's Pearmain.
Winesap.
White Winter Pearmain.
Vandevere.
Rawle's Janet.
Hall.

List of Apples for Georgia and adjacent regions, made for this work by Wm. N. White, of Athens, Ga., author of "Gardening for the South."

BEST THREE.

Shockley. (Quality not up to the mark, but its other merits make it desirable.)
Red June.
Buncombe, or Meigs.

BEST SIX.

Red June.
Horse.
Meigs.
Mangum.
Nickajack.
Shockley.

BEST TWELVE.

Early Harvest.
Red June.
Horse.
Bachelor.
Meigs.
Disharoon.
Green Crank.
Mangum.
Kentucky Streak.
Nickajack.
Stevenson's Winter.
Shockley.

The American Pomological Society has published select lists of Apples, obtained from the several reports from all the States, from which the following condensed summary has been made. The figures in the first column give the number of States in which the sort has proved successful; those in the second column show the number of these States in which it has proved of great value or eminently popular.

List I.

Apples which are adapted to the country generally, or to the Eastern, Middle, Western, and Southern States, in a greater or less degree. Nearly all are *early apples*, from which we learn that a new early sort will be more likely to succeed everywhere than later varieties.

Red Astrachan	31	12
Early Harvest	29	9
Maiden's Blush	28	8
Fall Pippin	24	4
Gravenstein	23	5
Sweet Bough	23	4
American Summer Pearmain	23	3
Summer Rose	22	1
Duchess of Oldenburgh	21	2
Golden Sweet	19	3
Hubbardston Nonsuch	18	6
Williams' Favorite	16	4
Early Joe	15	1
Lady Apple	11	—
Sops of Wine	9	—

List II.

Varieties adapted to the East and West.

Primate	21	1
Tallman Sweeting	20	4
Fameuse	20	4
Porter	20	1
Rambo	17	1
Jersey Sweet	17	—
Jonathan	16	4
Tompkins Co. King	16	1
Wagener	16	1
Benoni	16	—
Peck's Pleasant	15	5

Keswick Codlin	15	4
Northern Spy	14	2
Twenty Ounce	14	2
Mother	14	1
Hawthornden	14	—
Yellow Bellflower	13	1
Wine	13	—
Lowell	12	1
Golden Russet of W. N. Y	11	2
Late Strawberry	11	1
Dyer	11	1
Westfield Seek-no-further	11	—
New York Vandevere	10	1
Corlies' Sweet	10	—

List III.

Varieties adapted to the West and South.

Carolina Red June	21	5
Ben Davis	19	6
Rawle's Janet	16	7
Pryor's Red	13	7
McAfee's Nonsuch	13	3
Summer Queen	13	1
Shockley	11	4
Newtown Pippin	11	2
White Winter Pearmain	11	2
Buckingham	10	3
Horse	9	4

List IV.

Western Apples only.

Winesap	19	7
Smith's Cider	14	5
Hightop Sweet	14	—
Winter Sweet Paradise	10	2
Willow Twig	9	2
Fall Wine	9	1

List V.

SORTS FOR VARIOUS LOCALITIES.

Eastern and Middle States.

Rhode Island Greening	16	9
Roxbury Russet	15	6
Cogswell	9	3

Middle and Western.

Gilpin	18	1
Fallawater	10	6

Middle, Western and Southern.

Early Red Margaret	11	2

Southern alone.

Green Cheese	9	3
Nickajack[1]	8	3

Eastern alone.

Baldwin	16	9
St. Lawrence	10	3

SELECT LIST OF PEARS

Adapted to General Cultivation.

The Pear is less affected than the apple by differences in latitude and longitude, but more influenced by soil and cultivation. The following list is made out from the Reports of the American Pomological Society, the first named receiving the largest number of votes.

List of Pears succeeding in twenty or more States or districts.

Seckel.
Bartlett.
Flemish Beauty.
Louise Bonne of Jersey.
Belle Lucrative.
Tyson.
Winter Nelis.
Beurré d'Anjou.
Easter Beurré.
Buffum.
Summer Doyenné.
Beurré Diel.
Urbaniste.
Vicar of Winkfield.
Lawrence.
Bloodgood.
Duchesse d'Angoulême.

List of Pears reported as succeeding in ten or more States or districts, and probably adapted to others.

Madeleine.
Dearborn's Seedling.
Glout Morceau.
Onondaga.
Rostiezer.
Boussock.
White Doyenné.
Pinneo, or Boston.
Beurré Bosc.
Beurré Giffard.
Sheldon.
Beurré Clairgeau.
Osband's Summer.
Brandywine.
Howell.

The following varieties are reported from several of the States, but are generally regarded as less valuable than the preceding:

Washington.
Beurré Superfin.
Oswego Beurré.
Nouveau Poiteau.
Ananas d'Eté.
Napoleon.
Autumn Paradise.
St. Ghislain.
Kingsessing.
Beurré Langelier.
St. Michael Archangel.
Doyenné d'Alençon.
Duchesse d'Orleans.
Cabot.
Jaminette.
Manning's Elizabeth.
Jalousie de Fontenay.
Duchesse de Berri d'Eté.
Heathcot.
Golden Beurré of Bilboa.
Grey Doyenné.
Figue d'Alençon.
Julienne (Southern).
Kirtland.
Stevens' Genesee.
Andrews.
Columbia.
Dumas.
Beurré Hardy.
Beurré d'Aremberg.
Fulton.
Pratt.
Pound.
Catillac.
Lodge.
Marie Louise.

HARDY PEARS.

The following pears succeed well in the northern parts of this country:

Flemish Beauty.
Urbaniste.
Fulton.
Buffum.
Onondaga.
Sheldon.
Beurré d'Anjou.
McLaughlin.
Winter Nelis.
Lawrence.
Tyson.
Osband's Summer.
Beurré d'Amalis.

PEARS FOR THE SOUTH.

List by Wm. N. White, of Athens, Ga., and adapted to the Southern States.

Best Three.

Bartlett.
Lawrence.
Seckel.

Best Six.

Doyenné d'Eté.
Seckel.
Bartlett.
St. Michael Archangel.
Belle Lucrative.
Lawrence.

Best Twelve.

Doyenné d'Eté.
St. Michael Archangel.
Beurré Giffard.
Beurré Bosc.
Bartlett.
Columbia.
Buffum.
Lawrence.
Belle Lucrative.
Winter Nelis.
Seckel.
Josephine de Malines.

Three good on Quince.

Louise Bonne of Jersey.
Easter Beurré.
Duchesse d'Angoulême.

For six, add Glout Morceau, Columbia, Beurré Diel.

The following numbers taken from the Catalogue of the American Pomological Society, indicate the degree of popularity of several of the established standard sorts of pears in the different States of the Union, each number showing the number of States in which the respective varieties are highly recommended :—

Bartlett	32	States.
Seckel	32	"
Beurré d'Anjou	29	"
Lawrence	29	"
Angoulême	29	"
Doyenné d'Eté	29	"

Buffum	27	States.
Flemish Beauty	26	"
Bloodgood	26	"
Howell	25	"
Belle Lucrative	25	"
Louise Bonne of Jersey	25	"
Dearborn's Seedling	25	"
Onondaga	24	"
Winter Nelis	23	"
Doyenné Boussock	22	"
Beurré Superfin, Beurré Diel	22	"
Beurré Giffard	22	"
Tyson, Rostiezer, Sheldon	20	"
Vicar of Winkfield	20	"
Bosc, Clairgeau, Easter Beurré	19	"
Osband's Summer, White Doyenné	18	"
Glout Morceau, Brandywine	15	"

List of Fifty approved Pears ripening in succession.

Doyenné d'Eté.
Bloodgood.
Osband's Summer.
Beurré Giffard.
Manning's Elizabeth.
Brandywine.
Rostiezer.
Limon.
Tyson.
Clapp's Favorite.
Bartlett.
Boussock.
Washington.
Beurré Beaumont.
Ananas d'Eté.
Belle Lucrative.
Buffum.
Flemish Beauty.
Church.
Pratt.
Beurré Hardy.
Seckel.
Heathcot.
De Tongres.
Louise Bonne of Jersey.
Beurré Superfin.
Dix.
Sheldon.
Urbaniste.
Beurré Kennes.
Des Nonnes.
Beurré Bosc.
Duchesse d'Angoulême.
Doyenné du Comice.
Conseiller de la Cour.
Beurré Diel.
Howell.
Fulton.
Beurré d'Anjou.
Beurré Clairgeau.
Dana's Hovey.
Josephine de Malines.
Winter Nelis.
Lawrence.
Glout Morceau.
Beurré Langelier.
Columbia.
Passe Colmar.
Beurré Gris d'Hiver.
Doyenné d'Alençon.
Easter Beurré.

SELECT LIST OF PEACHES.

List of Approved Sorts ripening in the order named.

Hale's Early.
Serrate Early York.
Early Tillotson.
Cole's Early Red.
Early Newington.
Troth's Early.
Large Early York.
George the Fourth.
Grosse Mignonne.
Crawford's Early.
Brevoort.
Nivette.
Bellegarde.
Morris White.
Oldmixon Free.
Bergen's Yellow.
Druid Hill.
Ward's Late Free.

List for Southern States, by Wm. N. White, of Ga.

BEST THREE.

Early Tillotson.
Crawford's Early.
Heath Cling.

BEST SIX.

Early Tillotson.
Crawford's Early.
Stump the World.
Oldmixon Cling.
Washington Cling.
Heath Cling.

BEST TWELVE.

Early Tillotson.
Amelia.
Crawford's Early.
George the Fourth.
Stump the World.
Crawford's Late.
Chinese Cling.
Oldmixon Cling.
Washington Cling.
Heath Cling.
Nix Late.
Lemon Cling.

The following is a list of the varieties recommended in the report or catalogue of the American Pomological Society for the different States, the columns of figures indicating the same approval of each sort as with the list of apples :

Crawford's Early	26	14
Crawford's Late	23	7
Heath Cling	22	11
Oldmixon Cling	22	11
Gross Mignonne	22	6

Large Early York	21	8
Oldmixon Free	21	14
Troth's Early	18	2
Columbia (mostly South)	15	7
Lemon Cling	18	6
Early Tillotson (mostly South)	17	4
Smock	17	3
George the Fourth	17	2
Hale's Early	16	5
Cooledge's Favorite	12	1
Early Newington Free	11	1
Cole's Early Red	10	1
Susquehanna (mostly South)	13	5
Ward's Late Free	13	3
Lady Parham (South)	8	7
Indian Blood Cling (South)	9	6
Eaton's Golden (South)	7	4

The following had fewer votes, viz.: Amelia (excellent Southern variety), Barnard, Bergen's Yellow Druid Hill, Haines' Early, La Grange, Large White Cling, Morris White and Yellow St. John of the South.

SELECT LIST OF PLUMS,

In the order of their general approval.

Lombard.
Damson.
Washington.
Imperial Gage.
Smith's Orleans.
Wild Goose.
Coe's Golden Drop.
Jefferson.
Prince's Yellow Gage.
Lawrence Gage.
Reine Claude de Bavay.
Green Gage.
Bradshaw.
McLaughlin.

SELECT LIST OF CHERRIES,

In the order of ripening.

Early Purple Guigne.
Belle d'Orleans.
Governor Wood.
Coe's Transparent
Black Tartarian.
Mayduke.
Rockport.
Early Richmond.
Elton.
Black Eagle.
Yellow Spanish.
Downer's Late.
Belle Magnifique.
Morello.

SELECT LIST OF NATIVE GRAPES,

In the order of ripening.

Hartford Prolific.
Adirondac.
Delaware.
Creveling.
Concord.
Iona.
Diana.
Rebecca.
Isabella.
Allen's Hybrid.
Maxatawney.
Catawba.

The general approval of several of the most popular and older American grapes, is shown by the following numbers taken from the Catalogue of Fruits of the American Pomological Society, the numbers given indicating the number of States in which they have been highly recommended :

Concord	31
Delaware	30
Hartford Prolific	27
Clinton	23
Ives	21
Norton's Virginia	18
Diana	15
Catawba	14
Isabella	12
Scuppernong	10
Agawam and Israella	9
Herbemont and Iona	8
Alvey, Elsinboro'	7
Rebecca and Massasoit	7
Adirondac	6

Walter is reported as promising well in 22 States, Maxatawney and Telegraph in 16, Croton in 15, Wilder and Martha in 10.

STRAWBERRIES.—*New England.*—Wilson, Triomphe de Gand, Jenny Lind, Hovey's Seedling, and Charles Downing.

Middle States.—Wilson, Charles Downing, and Triomphe de Gand.

Southern States.—Green Prolific, Charles Downing, Longworth's Prolific, Wilson, Triomphe de Gand, and Kentucky.

Western States.—Wilson, President Wilder, Nicanor, Longworth, Kentucky, Ida, and Green Prolific.

APPENDIX.

NEW EARLY PEACHES.

Amsden. (Amsden's June.) A new variety, proved only in one neighborhood, but promising to be one of the earliest, if not the very earliest peach known, ripening two or three weeks before Hale's early. Size medium, roundish, shaded and mottled red; flesh melting, juicy, excellent, nearly free from the stone. Flowers large, leaves with globose glands. Tree vigorous. Carthage, Mo.

Early Alexander, another new variety in Ohio, is believed to be nearly, if not quite as early as the preceding.

Early Beatrice is a new peach raised by Thomas Rivers, of England, and proves to be an excellent and very early peach in this country, ripening about ten days before Hale's early. It is rather small in size, slightly oblong, of a brilliant and beautiful color.

Early Louise is another new English peach, rather larger than the last named, and a little later.

Early Rivers, still another from the same source, is rather large, excellent in quality, and ripening a little before Hale's.

Foster.—Large, yellow-fleshed, rich and juicy, somewhat resembling the Crawfords. Rather late. Mass.

Amelia.—An excellent southern peach, large, roundish oblong, shaded and marbled with crimson; flesh white, melting, rich. Rather early.

Mountain Rose.—Large, roundish; color a dark rich red on a whitish skin; flesh nearly white, stained at the stone; juicy, slightly vinous. Rather early. N. J.

CUTTING GRAFTS (p. 37).—Cut these in autumn if you have a good place to pack them. They will have more vigor in spring than if exposed to the cold of any severe winter—this is especially the case with plums, pears and cherries. Pack them in boxes of

damp (not wet) moss, or in small boxes of damp (not wet) sawdust—large boxes of sawdust will heat. Mark every sort carefully and plainly. Another good way to keep scions through winter is to place them snugly in a box till it is more than half full; next nail in two or three cross-pieces to hold them, and then bury the box inverted with several inches of earth over it, on a dry spot or knoll. They will thus be kept from contact with the wet earth, and will receive enough moisture from below to keep them fresh and plump. Cuttings of currants, grapes, quinces, gooseberries, etc., are to be taken off in autumn, and they may be kept till early spring in the same way as grafts, or they may be set out at once, pressing the earth compactly against them, and covering well till spring, with manure, litter, leaves, or evergreen boughs.

MARKETING FRUIT.

PACKING PEARS FOR CONVEYANCE BY RAILROAD.—For marketing by the quantity, the best way is to pack them in half-barrels. Remove one head, and turn the barrel upside down, so that the pears put in first will open at the top when they are to be taken out for use. Procure a quantity of white printing paper for lining the half-barrels. This will give the whole a neat, finished appearance, preserve the pears better, and give them a higher price. First place a folded sheet in the bottom, and then a layer of pears over it, and proceed to fill the barrel by laying the specimens in compactly, shaking occasionally very slightly, to settle them. It is of great importance that they be packed as closely as possible without bruising, so that they may not work loose on the way; for as soon as they begin to "rattle" in the barrel they are inevitably ruined. We have known handsome pears which would have brought ten or twelve dollars a barrel, completely spoiled by being placed loosely and carelessly in the barrel. As they are filled in, line the sides with white paper, and cover the top well with it. Let the top surface of the pears be about three-fourths of an inch above the lower surface of the inserted head, so that when the head is borne down by the screw or lever, it shall press them down three-fourths of an inch. This will bring them closely and firmly together, and prevent rattling—the elasticity of the fruit admitting of this pressure. It is better to have the surface project upwards an inch, than less than three-fourths. Never put in mellow specimens for long

conveyance—two or three in a package will cause the whole to yield, become loose, and be spoiled. Mark the direction neatly, and they will sell better than if marked carelessly or in a bungling manner. For sending a few specimens of fine fruit, each should be wrapped separately in tissue or other paper.

MARKETING PEACHES.—Those who have formerly been in the practice of purchasing peaches gathered when half ripe, and with their flavor less than half developed, will be glad to learn that it has now become fully established that ripe peaches (not soft) carry the best, and do not decay as soon as those in a half green state. Dr. Hull, of Alton, Ill., an extensive fruit-grower, stated at the St. Louis Pomological meeting that he had been shipping fruit to half a dozen different States, and that he has found that when fully mature, and packed tight enough to prevent all friction or rattling, they will "carry six days safely." He uses baskets only, placing oak leaves in the bottom and between layers.

MARKETING STRAWBERRIES.—While many superficial or careless managers cannot send strawberries fifty miles in good salable condition, the late J. Knox, of Pittsburg, was in the practice of sending his four hundred miles, and receiving double and triple prices for them. The fruit was allowed to ripen before picking. Mr. Knox remarked: "We allow the fruit to mature enough for our own table before it is gathered for market." It was handled with great care, carefully assorted, and as carefully packed in neat boxes. So large and finely grown were the berries that ten filled a pint box. He has sent the Jucunda to New York on Monday, reaching there on Tuesday, kept it until Friday and Saturday, and sold then at higher prices than other berries raised in the immediate vicinity of the city. So much for doing a thing well.

SELECTING AND ASSORTING FRUIT.—The truth cannot be too strongly impressed on fruit-raisers, that on nothing does success in marketing more depend than on selecting good specimens only. The work should be commenced by thinning on the trees, while the young fruit is yet small, and its importance should not be lost sight of at any subsequent period. Cases have occurred where owners, in their eagerness to sell everything, have put a few poor specimens in a barrel of fine market pears, and these poor ones have spoiled the sale of the whole. Very fine pears are often sold at twenty-five or fifty cents apiece; on the other hand a few bad ones will so reduce

the market value of the rest as to cost the owner not less than twenty-five or fifty cents each. The editor of the *Horticulturist* says that a peach-grower, having discovered that his men brought in many poor peaches, had them assorted carefully before shipping, and forty baskets of cullings taken out of every hundred. The sixty good ones were then sold for $1.25 per basket, bringing $75. The unassorted ones would bring only sixty cents per basket, or $60 for the whole, while the freight on the forty baskets of poor ones, mixed with the good, would have greatly increased the weight and expenses.

FRUIT-ROOMS (p. 118).—After a good supply of fresh fruit is raised, the next provision is a suitable apartment to keep it in. It is here that the great deficiency exists with many cultivators. Fruit decays rapidly if too warm, withers if too dry, and rots when too damp. We have known some cultivators to lose all their winter fruit by the end of March because only ordinary cellars were provided for it, while others with no better crops, have kept a good supply perfectly fresh till the ripening of strawberries and currants, by means of well-built and well-managed fruit-rooms.

The same causes which spoil and induce early rotting in winter fruit, prevent the keeping of late autumn fruit into winter. For example, take the Beurré d'Anjou pear, which if placed without care in warm apartments when gathered, may not keep into December; while, with the best management, specimens have been retained perfectly fresh into February and March.

The best fruit-rooms are built above ground. They admit of more perfect control of the temperature, and may be kept cooler through autumn—a matter of much importance. For such rooms the walls must of course be double, and filled in with powdered charcoal, ashes, tan, or similar substance, which is rather better than to have the inclosed space occupied only with air. The ceiling or roof must also be double, and well secured from the intrusion of frost from above. Such rooms may be made to open on the north side, so as to be kept cool till the advent of the freezing weather of winter. Fruit, in an apartment thus managed, will keep much better than otherwise. We have experimented fully on this point, and observed the difference between the keeping of winter apples taken directly from the trees and placed on the shelves in October, and others placed, when gathered, on the floor of an out-building fronting north, and allowed to remain there nearly till the first day of December. The latter, at a careful estimate, *did not*

furnish more than one-quarter the number of decayed specimens through the winter as those placed at once in the warm cellar when gathered.

The walls of fruit-houses above ground may be built of brick, with a hollow space between the two portions or walls, or of double wood siding filled in. The windows should of course be double, or the sash at least with double glass. The entrance door should also be double, or made of two parts with a space between.

It usually happens, however, that some outhouse may be wholly devoted to this purpose for the few weeks required, and used for other purposes at other times. A few days before the usual time of freezing up for winter, the fruit is assorted and carefully conveyed to the fruit-room. This may be an apartment in the cellar or basement, entirely separated from the rest of the cellar by an eight-inch brick wall, or other good partition. If there are windows on opposite sides, they will admit of ventilation when required; but where this is not the case they should be placed near each end, so as to cause a circulation of air throughout. Much depends on the right degree of moisture or dryness in the fruit-room, and other influences being the same, it depends much on the character of the subsoil. If there is a fine, dry, gravelly or sandy bottom at all times of the year, so as to give a perfect natural drainage, the apartment will be dry enough with a smooth beaten earth floor, and side walls of masonry. But if the cellar is dug in damp earth, clay, or hardpan, which becomes saturated with water when long rains occur, or in early spring, a good thick cement floor and cement sides will be necessary. We have seen very wet cellar apartments made dry enough by means of a good water-lime bottom; but when this alone is not sufficient, an additional coating of the same material at the sides has made the whole quite dry. The windows should be hung on hinges, and hooks provided, so that they may be opened partly or wholly, according to the temperature of the air without. Two thermometers should be hung in different parts of the room, to assist in regulating the temperature, which should be kept within a few degrees of the freezing point, with as little variation as practicable.

The fruit may be placed for keeping in boxes, drawers, or on shelves. It will keep well headed up in barrels or casks, so long as it remains free from decay, but when this commences the confined air only accelerates it. For common, every-day use more ready access is best, when any decaying specimens may be seen and readily removed.

THERMOMETERS IN FRUIT-ROOMS.—The keeping of apples and other fruit depends greatly on the temperature. If the room is too closely shut, from a fear of freezing, the fruit may decay in a few weeks; if kept cold, and with some circulation of air, it will remain sound until spring. The truth is, too much is left to guess-work, and hence, while sometimes the temperature may be up to fifty or sixty, it may, on the other hand, run down below freezing on the occurrence of a cold snap, the owner or attendant not always being able to judge. Thermometers are cheap, and such cheap ones will answer the purpose well, not usually varying more than a degree or two at ordinary temperatures. Hang one near the ceiling, and another near the ground. Let the windows of the fruit room be hung on hinges, so that they may be opened to any degree. By means of these windows and the thermometers, the temperature may be kept down to within a few degrees of freezing, if they are examined say twice a day, or night and morning, and the fruit kept sound and fresh, and the owner will no longer work in the dark or by guesswork.

KEEPING FRUITS.—The following rules for keeping fruits are from the proceedings of the Royal Horticultural Society of England:

1. As the flavor of fruit is so easily affected by heterogeneous odors, it is highly desirable that the apple and pear rooms should be distinct.

2. The walls and the floor should be annually washed with a solution of quicklime.

3. The room should be perfectly dry, kept at as uniform a temperature as practicable, and be well ventilated, but there should not be a thorough draught.

4. The utmost care should be taken in gathering the fruit, which should be handled as little as possible.

5. For present use, the fruit should be well ripened; but if for long keeping, it is better, especially with pears, that it should not have arrived at complete maturity. This point, however, requires considerable judgment.

6. No imperfect fruit should be stored with that which is sound, and every more or less decayed specimen should be immediately removed.

7. If placed on shelves, the fruit should not lie more than two deep, and no straw should be used.

To Color Pears.—Josiah Hoopes, the well known West Chester, Pa., nurseryman, says that to give a high color to pears "all that is necessary will be to spread a blanket on the floor of a cool room, and then thinly and evenly place the fruit on the floor. A second blanket must be spread over them, and in a short time the effect of this treatment will be apparent in the most golden colored Bartletts, and rich, ruddy-looking Seckles imaginable. Pears perfected in this manner rarely have the mealiness of their naturally ripened companions; nor do they prematurely decay at the core, as when left on the trees."

Grapes Overbearing.—Do not allow grape-vines to overbear. Many a young vineyard has been injured, if not ruined, by carrying too much fruit. Novices often delight to show how many grapes they have on their young vines, and to tell how many tons per acre their new vineyards have yielded. Thin out the bunches as soon as they have set, and let the crop be small. It will be all the better in quality, and the vines will preserve their health and vigor.

Grape Seedlings.—Novices sometimes complain that the seeds of grapes do not grow when planted. It is important that they are not allowed to become much dried, and that when planted, the surface be kept moist. A correspondent of the *Rural New Yorker* says that formerly not a fourth part of the seeds which he planted germinated and grew. Accidentally covering part of the bed with leaf-mould and rotten leaves, he found they grew freely and abundantly under this mulching. He then made an entire bed of rotten leaves and mould, watering the bed after the seed was planted, every other day. Nearly all grew and made vigorous plants. The varieties planted were Catawba, Isabella, Concord, Clinton, Delaware, Ives, etc.

ADDITIONAL NOTES ON INSECTS.

The Apple Worm, or Codling Moth (p. 147).—This insect has become the most formidable enemy of the apple in the United States. It does much damage to the pear, but does not attack stone-fruit. In many orchards it ruins nearly the whole crop, and is now penetrating into States beyond the Mississippi. The moth,

or miller, which may be distinguished from all other moths by a patch of burnished coppery scales at the tip of its front wings, appears first early in summer, and lays its eggs in the blossom end of the young apples, a single egg in each. The young larva soon hatches and burrows towards the core, eating as it goes. In three or four weeks, or more, it is full grown, and the young apples fall to the ground nearly at the same time. The larva passes out through a round hole which it makes, and crawls for some place to spin its cocoon, usually to the rough trunk of the tree. The moth, or miller, comes out in a few weeks for a second brood, but the apples have now grown so large that fewer fall to the ground from the injury, but they are more or less spoiled for use and market. The insects are often found in them after the crop is gathered for winter, and hiding in various places, spin their cocoons, and come out in spring to perpetuate their mischief. Prof. Riley says, that in a barrel of wormy apples which he broke up early in the spring, he found about two hundred such cocoons; and estimating that one barrel would furnish a hundred winged females, each of which would lay two hundred eggs and spoil as many apples, and allowing a hundred apples to the bushel, he arrived at the result that two hundred bushels of apples may be ruined by the insects from one apple barrel, if allowed to escape.

The remedies for the prevention of the work of this formidable insect are of two kinds, and are founded on the destruction of the larva while in the fruit, and of the cocoons before the miller comes out. Animals which would pick up and devour the young and infested fruit as soon as it falls, would perform the first-named service. Swine, if sufficiently numerous, answer the purpose well; but as few owners of large orchards have herds large enough, it is proposed to employ sheep, which are known to eat the young apples readily, and which may commonly be had in large flocks. The bark of the trees may possibly need protection from them. In the few instances where they have been thoroughly tried, year after year, they have given smooth and fair crops. Oliver Chapin, of East Bloomfield, N. Y., recommends the practice of employing boys to pick the infested apples from the trees, stating that one boy would pick several bushels in a day. The second remedy—destroying the cocoons—may be effected in part by passing bands of cheap coarse paper around the trunks of the trees early in summer, and afterwards crushing the cocoons which form under these bands; and also by placing pieces of old carpets, etc., in the forks, and then crushing those which adhere to them.

The TENT CATERPILLAR, or common orchard caterpillar, described on p. 144, is sometimes confounded, by superficial observers, with another insect, known as the *Fall Web-worm*, which hatches out, not early in the spring, but after midsummer. Both make a web or tent; but the Fall Web-worm has a wider range of trees for its food. It spins a cocoon late in summer, and does not come out till the following summer. The moth or miller is white, and it deposits its eggs in an irregular mass on a leaf, where they soon hatch and the larvæ begin their work.

FOREST TENT CATERPILLAR.—This insect (*Clisiocampa sylvatica*) resembles in some particulars the tent caterpillar of the orchard (*C. americana*), but differs in being less confined to nests, and in the markings of the larva and moth. The middle of the back of the larva is marked with a row of small spatula-shaped white spots; while in the common tent caterpillar the back has a continuous white line. On the perfect insects, the former is darker between the bars of the wings; on the latter the wings are lighter between the bars. It appears only occasionally in large numbers. In the year 1867 it was quite destructive in Western New York, and received the erroneous name of "Army Worm," the true army worm being a southern insect, which destroys large fields of grass.

Fig. 495.

Like the common orchard caterpillar, the miller deposits its eggs in the form of a ring or cylinder, on the young twigs; but instead of the rounded form given to the mass of eggs of the orchard caterpillar, the eggs of the forest caterpillar form a distinct even-sized cylinder, with square ends, as in Fig. 495. Each mass contains about 300 or 400 eggs. The eggs are small, about the twenty-fifth of an inch long, and the fiftieth part of an inch in diameter. These eggs are deposited about midsummer, and the larvæ hatched early the following spring. They are very hardy, and endure any cold snap that follows. They commence spinning a web wherever they go.

The forest caterpillar spins a web close to the tree, but as it grows larger it wanders far away, and hence is generally supposed to have no web. In its travels it generally selects smooth surfaces, and seems to have a special liking to the cap-boards of board-fences. It often swings down on a web from trees, and when numerous in forests proves quite annoying to persons traversing the woods. It devours the leaves of different kinds of trees, but seems to prefer

the basswood, of which large trees have been stripped entirely bare. In the orchard it is particularly destructive to the foliage of the apple. On account of its wandering character it is more difficult to attack and destroy in masses, and for this reason more care should be taken to cut off and destroy the rings of eggs before they hatch, in the orchard trees when they are found.

The American Entomologist describes several insects which destroy this caterpillar, and commonly keep it in subjection, except during those occasional years when it appears in the greatest numbers. But generally "these cannibals and parasites do their work so effectually that it is seldom exceedingly numerous for more than two successive years in one locality."

THE CURCULIO (p. 152). The importance of a sharp blow to bring down these insects is pointed out on page 154. More recently the practice of inserting iron spikes in the tree, on which to strike, has been adopted with great success. The spikes should be blunt where they enter the tree, so that striking will not drive them in further. Short pieces of iron rod answer well. Holes being bored for them they are inserted part way as shown in Fig. 496. On the heads of these a blow of a large hammer will bring down every curculio. When the trees are small, one spike in each tree is sufficient; when they become quite large, it will be best to insert one in each of the larger limbs, as shown at *b b*, Fig. 497.

Fig. 496.

Fig. 497.

Dr. Hull's curculio catcher consists of a large hopper-shaped frame covered with white muslin, and fastened to the top of a wheelbarrow, the front frame of which is pushed suddenly against the tree, jarring down the insects into the hopper. It requires the stem of the tree to be trimmed up three or four feet high, to pass under the branches. The sheets described on page 154 may be used for low branching trees, like the one shown in Fig. 497, from which also a large portion of the crop may be picked while standing on the ground. Brown's patent catcher is similar to Dr. Hull's, with the improvement of using glazed oil-cloth for the hopper, down the

smooth surface of which the insects roll freely, and it is not affected by wet weather. A closed box at the bottom receives and holds the insects, and the jarring is easily performed on all parts of the tree by means of a small mallet on the end of a pole.

CURRANT WORM (p. 156).—There are three distinct insects which commit depredations on currant and gooseberry leaves, namely, the Currant Span Worm, which comes out in the form of a miller or moth, the Imported Currant Worm, and the Native Currant Worm, both of the latter forming four-winged flies in the perfect state.

The Currant Span Worm (*Ellopia ribearia*) is represented in the following figure (Fig. 498), the natural size and appearance. It is about an inch long, bright yellow, with numerous black spots. The head is white, with eye-like spots. It devours the early leaves of the gooseberry and currant, and when about to change, hides under rubbish, clods, or descends into the ground and changes to the chrysalis, No. 3. In two weeks it comes out in the form of a moth or miller, of a dull yellowish white, with dark colored spots towards the ends of the wings. The spread wings measure about an inch and a quarter. The figure (Fig. 499) represents its appearance, but is too dark. Where the larvæ have been numerous, and have stripped the currant row, this miller may be often seen in considerable numbers, flying over the bushes and laying its eggs on the twigs. Here the eggs remain till the

Fig. 498.—*Currant Span Worm.*

Fig. 499.—*Moth of Currant Span Worm.*

following season, and hatch out about the time the gooseberry and currant leaves expand, ready for devouring them.

As the eggs remain on the bushes during the time that nursery men dig and pack them for distant conveyance, care should be taken that the insects are not thus carried to places where they were previously unknown.

THE IMPORTED CURRANT WORM (*Nematus ventricosus*) is represented in Figs. 500 and 501; *a a*, the larvæ in the act of devouring gooseberry leaves; *b*, an enlarged view of one of the abdominal joints, to show the position of the black spots.

Fig. 500.—*Imported Currant Worm—Larvæ.*

In Fig. 501 are magnified representations of the male (*a*) and female (*b*), the cross lines showing the natural size. The perfect insect makes its appearance as soon as the leaves of the gooseberry and currant are fairly expanded, and lays its eggs on the underside of the leaves, along the principal veins, and not, like the span worm, on the young twigs. If the latter deposited eggs on the leaves they would fall to the ground, as they remain unhatched till the following season, as already stated.

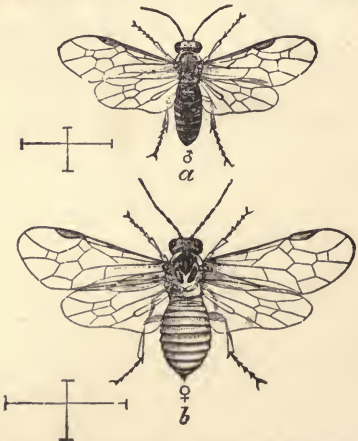

Fig. 501.—*Perfect state of Imported Currant Worm—upper, male; lower, female*

The eggs of the imported worm soon hatch into twenty-legged worms, of a green color, having at first black heads and numerous

black dots over the body; but after the last moulting they are entirely green, except the large eye-dots and the three yellowish joints, one next the head, and the others at the rear. They are about three-fourths of an inch long when full grown. When, as usually happens, they are in large numbers, they rapidly consume the leaves, and whole rows of bushes have been entirely stripped in forty-eight hours. Hence the importance of close watching and prompt attention in applying the remedies to destroy them. A single defoliation, while it does not kill the bushes, retards growth, and commonly greatly injures or prevents the ripening of a crop; and if often repeated, so that the bushes remain bare for a long time, or for successive seasons, the bushes necessarily perish.

When the larvæ attain full size, they burrow under ground, or hide under scattered leaves, and spin an oval brown cocoon. After some weeks the perfect insect comes out, lays eggs as before, produces larvæ, which pass to the pupa state, and remain so till the following season.

The Native Currant Worm (*Pristiphora grossulariæ*) is smaller than the preceding, or about two-thirds in size, and otherwise resembles it somewhat in general appearance. Unlike that, the male and female differ but slightly. The larvæ are of a uniform pale green color (*a*—Fig. 502), without any black dots, which readily distinguishes it from the two others already described, the head becoming black. It spins its cocoons among the twigs and leaves. It appears later than the Imported Currant Worm, or near midsummer, and the second brood early in autumn. Unlike the last named, the second brood also passes to the state of winged insects the same autumn, and lays its eggs on the twigs of the bushes, where they remain till the next season.

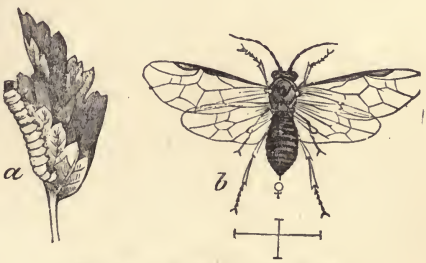

Fig. 502.—*Native Currant Worm.*

The remedy for the three species of currant worms is the same for each—namely, killing by poison. Unlike many other insects, this remedy is comparatively cheap, easily applied, and entirely successful if used promptly. It consists in dusting powdered

White Hellebore from a finely perforated dredging box, or from a box covered with fine muslin, so as to give the leaves a thin dusting of this poison. It may be had at drug stores. Do it in the morning when the dew is on, but do not wait for dew if the first worms have made their appearance. To prevent inhaling the dust, fasten the box to a short stick, apply it when there is only a faint breeze, and stand on the windward side. As soon as the insects devour it with the leaves, they curl up and die. It is desirable to give the leaves a very thin coating, and not to apply it in masses.

Grape Phylloxera.—Within a few years a small aphis has caused much injury to grape vines in this country, and great destruction to the vineyards in France. The delicate exotic vine appears to be more extensively injured by it than the stronger and more robust American sorts. It attacks the roots, causes excrescences on the smaller fibres, and they ultimately die. During the first year of attack its effects are not conspicuous in the vines above ground; about the third year the vine dies, at which time the insects have left it, and are not discovered. Various remedies have been proposed, but none that are completely satisfactory. Probably the best preventive is to plant only strong healthy sorts, as the Concord, or those which have been grafted on these healthy sorts, and to adopt long instead of short pruning. Among imperfect remedies, are soaking the soil before planting with strong soapsuds or weak lye; sprinkling the surface with lime, ashes, sulphur, or salt; or applying carbolic acid, added to water at the rate of 1 per cent., by pouring into crowbar holes so as to reach the roots. Sulphuret of carbon has been applied in the same way with imperfect success. Fertilizers, to keep the vines healthy and vigorous, are probably better. There are some insects which prey upon these enemies of the vine, that often keep them in check or destroy them, among which are a species of Thrips, the Lady bug, a Syrphus fly, and some others. Flooding the ground has been successful in a few cases, but is generally difficult and impracticable.

The Canker Worm (*Anisopteryx vernata*), p. 150.—The young larvæ hatch early in summer, and pierce small holes in the leaves, and as they grow larger they consume all the leaves except the larger veins. The larva is a measuring worm, nearly an inch long, ten-footed, black, dull yellow or greenish, very variable in color, commonly with an ash gray back, and a pale yellowish stripe along each side.

The canker worm spreads slowly from one orchard to another,

but is far more formidable than the tent caterpillar. It has until late years been mostly confined to portions of New England, but more recently it has spread largely through portions of Western New York, and will doubtless find its way elsewhere. It should be well known to cultivators that they may destroy it when it first appears. It attacks both leaves and fruit; and when numerous the webs and the denuded branches together give the trees at a distance the appearance of having been scorched. As the female cannot fly, various expedients for preventing it from ascending the tree in winter or early spring have been devised. One of the best contrivances for this purpose is represented in Fig. 503, and consists essentially of a band or circle of tin, a few inches outside the trunk of the tree, and held there by a circle of muslin, attached to the tin at its edge, and drawn with a cord at the top, so as to fit the tree closely, and prevent the insects from getting up without going over

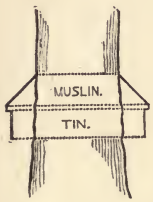

Fig. 504.—*Section.*

Fig. 503.—*Canker Worm Protector.*

Fig. 505.—*Section.*

the tin, which is covered with a mixture of castor oil and kerosene. As soon as they touch this they drop to the ground. Fig. 504 is a section of the contrivance, and Fig. 505 a section of the union of the tin and muslin, effected by turning over the upper edge of the tin before it is bent to a circle, inserting the edge of the muslin, and hammering them together. The tin may be about three inches wide, and long enough to rest three or four inches off from the trunk, when bent around in the form of a hoop, and secured by rivets or small tacks. After the tin and muslin are attached to the tree, the whole inner or lower surface of the tin is daubed with a mixture of equal parts of kerosene and castor oil. The tin and muslin entirely protect the oil from the sun and weather, and it will not dry for several days. It will not run down, as the castor oil thickens it. Of course it needs occasional renewal, with a small

brush or feather. This protector is kept on the tree till the worms disappear.

The canker worm crawls up the tree till it reaches the lower or inner side of the muslin, when it turns and passes down the muslin till it touches the tin covered with oil, when it almost instantly falls to the ground disabled. This protector is applied to the tree before the ground opens in spring, and is kept on till every indication of the canker worm has gone. An important advantage in this contrivance is the readiness with which it is applied to the tree, with a variation of several inches in size, as well as its cheapness.

Another good remedy is to place bands of sheathing-paper six or eight inches wide, tacked around the trunks of the trees, and then cover them with refuse printer's ink. The ink costs 12½ cents per pound, requires from two to four applications each season, and the whole cost is about ten cents for each tree annually.

BARK LOUSE (p. 148).—Dr. Le Baron, State entomologist of Illinois, recommends, according to the Prairie Farmer, a wash of soapsuds, of a strength varying with the age of the parts of the tree to which the application is made. A whitewash brush is used, first with strong suds, made of one part soap and three or four of water, and then a wash of a weak solution, or many times diluted, applied with a syringe. This must be done the last of May or early in June, when the young lice are just hatched.

The best means to extirpate bark-lice, according to Dr. Fitch, are those recommended by Mr. Kimball, of Kenosha. He boils leaf tobacco in strong lye till it is reduced to an impalpable pulp, and mixes it with soft soap, which has been made cold, to make the mass about the consistence of thin paint, the object being to obtain a preparation that will not be entirely washed from the tree by the first rains. The application must be thorough to the body, limbs, and twigs, or wherever a louse is detected. This should be done with a paint-brush before the buds start in the spring, and if the painting is faithfully performed the death of the lice will be assured.

There is one department of insect study, which we can only briefly allude to, that possesses great importance, and which is very little understood except by scientific men. This is the knowledge of *useful insects*—those which confer a great favor on the cultivator by thinning the ranks of his foes. The work of birds has been indiscriminately recommended as "destroying the insects," without knowing whether those insects are useful or noxious. In one

instance birds were seen devouring, as was supposed, a destructive caterpillar; but it was found, on a scientific examination, that they were only picking a parasitic insect from the caterpillars. The parasitic insect was assisting the cultivator, and the birds were feeding upon his best friends. One of the most useful insects of this kind is the Lady-Bug—of which we represent a single species,—the Convergent Lady-Bug, in the accompanying cut (Fig. 506). —*a* representing the larva, *b* the pupa, and *c* the perfect insect. We present this figure in order the better to explain an amusing occurrence, showing the blunders of ignorance, related by Dr. Fitch. The rose bushes of one of his neighbors were grievously infested by plant-lice. He complained to Dr. Fitch, that although he took the greatest pains to go over his bushes every morning and destroy all the "old ones," yet his bushes were ten times as badly injured as those of his neighbors, who took no pains with them. On examination it turned out that he had been killing off the Lady-Bugs, supposing them to be the "old ones," which were doing all they could to rid his bushes of the pest.

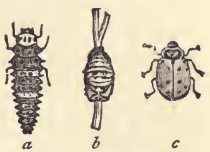

Fig. 506.—*Lady-Bug.*

Black Knot on the Plum (p. 160).—Remember the old and well tried remedy of cutting off as fast as the first indications appear. Do not wait till the tree is covered with these excrescences and destroyed. The complaint sometimes made, when the remedy is applied months too late, that cutting off does not cure the malady, would be like denouncing the use of water to extinguish buildings on fire, were the engine companies to begin to play upon the heaps of ashes the year after the city conflagration. The labor and attention needed to keep the plum thus clear of the knot are not half as great as to keep a potato or cabbage patch clear of weeds, which every one so willingly performs.

Mice Repellers.—Generally a smooth, compact mound of mellow earth, free from grass, and made a foot high, late in autumn, is best. But sometimes a roll of sheet-iron or sheet-tin is most convenient. Sheet-tin is best, and will rust less than iron, unless the latter is well coated with gas tar. Roofing tin, fourteen by twenty inches, will make four protectors to each sheet, seven inches high and three inches in diameter, costing about five cents each. They last many years. They may be applied after some

snow has fallen, with a little pressure and turning about. Fig. 507 represents one of these protectors, and Fig. 508 several nested together.

Mice and Rabbits.—Where these animals exist, they will be sure to do more or less damage in winter by gnawing the bark. The cleaner the cultivation of the ground, the less the danger from mice. If a small mound has not been thrown up around young trees before freezing up (which is a very perfect protection if well performed), then it will be best, after a fresh fall of snow, to tread it compactly about the bottom of the stems. The mice will not dig through the hard trodden snow. It should be repeated with new snowfalls. Rabbits are kept away by blood or rancid grease. Rub the skin of an old piece of pork, or a piece of fresh liver on the bark two and a half feet up from the ground, and their appetite for the anointed bark is spoiled. Blood is apt to be washed off by winter rains, and the application needs repeating; or the blood should be mixed with clay, which will prevent washing. Another way to exclude both mice and rabbits is to case the foot of the tree with sheathing paper, cording it on, or nailing it on with tacks. A few slits made in the bottom edge will enable it to spread a little, where it should be sunk slightly into the soil. For rabbits sheet-iron or tin is best, and should be thirty inches high.

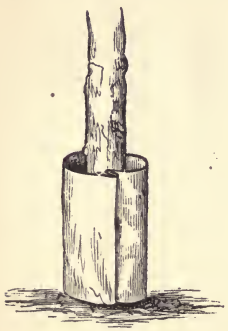

Fig. 507.

Fig. 508.

"It is useful to place a few shocks of unhusked corn on each acre of the orchard," remarks a correspondent of the *Country Gentleman;* "all the rabbits want is enough to satisfy their appetite, and they prefer corn to apple-tree bark. Lard and sulphur rubbed on the bark of trees is a good preventive, and does no damage to the trees. Snares can easily be set in the run-ways, and the rabbits destroyed. Sweet apples, cut in the middle, stuck upon a stick, and raised about six inches from the ground, with strychnine pricked into the edges, will be eaten by the rabbits at night, and you will find them dead in the morning. I do not recommend putting out poison while other remedies prove effectual."

MONTHLY CALENDAR OF WORK.

In the Nursery, Orchard, and Fruit-Garden.

(These directions, as they read, are mostly adapted to the season in the Northern States, but they may be made to apply readily to all other portions of the Union, by making them about one day earlier for each twelve miles of diminished latitude. For example, allowance should be made of about three or four weeks earlier for southern Virginia and similar latitudes, and six weeks or more for the Gulf States.)

January.

Tread the snow about young trees to prevent the gnawing of mice. Rabbits may be prevented from injuring trees by rubbing them with blood, see p. 186.

Provide surface drainage for water caused by thaws or rain.

Hardy young trees may be pruned in the winter, covering large wounds, as described on p. 92.

Cut grafts and pack them away, p. 37.

Guard carefully against the intrusions of cattle.

Tree purchasers may now ascertain where trees may be best obtained, and orders may be made out.

Nurserymen may prepare for spring work by procuring materials for packing, p. 143.

They may now commence root-grafting, p. 177.

Manure may be spread over the surface about young trees, to enrich the land, and protect from winter cold.

Young orchards should be accurately registered, p. 68.

Grape-vines for early fruiting by fire-heat, now coming into leaf, should be kept at 60° or 65°. Pinch upper shoots, and encourage lower, especially on vines in pots.

February.

Follow the directions of last month, most of which apply to the present.

Cut off and destroy all caterpillars' eggs on the shoots of orchards, p. 145.

Top-dress with manure the surface of orchards wherever they lack vigor, or which do not make annual shoots a foot or more long.

Provide or make labels, stakes, ladders, etc.

Grapes in early heated houses will now begin to swell their buds, and should be syringed night and morning. A temperature of 50° or 55° at night is enough for the first fortnight. Thin the bunches, but do not handle the berries.

For the Southern States, read the directions under March and April.

March.

Finish all uncompleted work mentioned for two past months.

Head down budded trees in the nursery rows before the buds have begun to swell.

Prune hardy grape-vines. Start grape eyes or cuttings, as described on p. 381.

Graft the cherry very early to prevent failure. Graft plums nearly as early.

Plant cherry stones as soon as the ground thaws, as they sprout early.

Shorten back peach trees, as described on p. 94.

In grape-houses, grapes under fire heat will need constant attention. Pinch laterals, thin bunches if too many, and give air and plenty of water. In colder houses (or green-houses), the leaves will commence expanding, and should be syringed daily till fully out.

For the South, read the directions under April and May.

April.

Prepare for setting out trees, p. 54.

Shorten back before the buds expand, pp. 59, 81.

Transplant strawberries, p. 412.

Uncover grapes, raspberries, etc., very early.

Set out currant, gooseberry, and quince cuttings as early as possible, p. 29; also seedling apples, young pear trees, etc.

Grafting the cherry and plum should always be done before the buds begin to expand.

Plant all sorts of fruit-tree seeds on the very commencement of their sprouting, or as soon as the earth thaws. Peach stones may be left later than others, as they do not start so soon.

Level down the small mounds thrown around the young trees last autumn, to protect against mice and winds, and spade in winter mulching.

Manure strawberries.

Prune old wood out of currant bushes and spade in manure, and the size of the berries will be greatly increased.

Uncover vines in cold graperies, and place them in position.

Pinch in the young shoots of grapes in green-houses towards the end of the month, and thin bunches. Grapes in hot-houses need uniform warmth and air.

Nurserymen will commence digging and packing as soon as the ground is open, p. 140.

For the Southern States, read the directions for May and June.

May.

Fruit-trees may be still set out, if dug early and kept from growing in a cool place, even if the leaves are partly expanded, but the shoots should never be cut back after the swelling of the buds.

Keep the soil clean and mellow about young trees, p. 70.

Rub all useless shoots from the stocks of young trees in the nursery which have been grafted, or which were budded last summer and headed down. This should be done at the moment of their starting, as removing foliage in large quantities always checks growth.

Stake up crooked trees, p. 62.

Mulch young trees when the soil cannot be cultivated constantly, but avoid watering before the leaves expand, p. 63.

Commence thinning fruit on overbearing trees.

Give air, warmth, and moisture to vines in houses.

Kill orchard caterpillars by swabbing with soapsuds or lime-wash.

Clear out borers from apple-trees, p. 145; and commence the destruction of the curculio, p. 153.

For the Southern States, read the directions for June.

June.

Continue the operations of last month wherever necessary, and increase cultivation and destroy weeds.

Make thorough work with the curculio, p. 153. Destroy aphides as soon as they appear by strong soapsuds, p. 147, and the currant worm by dusting with hellebore, p. 156.

Rub off early in the month all supernumerary shoots on out-door grape-vines, and on young fruit-trees. Thin berries on vines in

heated grape-houses, and pinch back laterals on those in cold houses. Keep up a mild, damp atmosphere.

Examine peach trees and destroy the peach grub, p. 151.

Thin out fruit on overbearing trees, p. 107.

Shorten back new shoots of the blackberry, p. 446.

Cut off all the parts of plum trees that show the first indications of black-knot, p. 160. Destroy caterpillars' nests that have escaped attention. Give slugs a dusting of dry lime, or dash them off with dry sand or powdered soil.

Mulch the surface of the earth around newly transplanted cherry trees.

JULY.

Continue cultivation to prevent the growth of weeds and the formation of a crust on the soil.

Mulch all young trees when cultivation cannot be given.

Continue thinning fruit, and rubbing off supernumerary shoots on young trees.

Pinch off the shoots of blackberries, as described in the chapter on this fruit.

Perform the operation of summer-layering the grape early in the month, p. 377.

Transplant strawberries, p. 412.

Commence budding all trees that have well formed or matured buds—the cherry usually first, then the plum and pear.

Continue watching for the peach-worm and apple-borer, pp. 146, 150, and cut off at their first appearance fire-blighted pear-shoots, and black-knot on the plum.

Secure cherry-stones for planting, by mixing the washed seeds with moist sand before they have dried, p. 136.

Give a good supply of air to ripening fruit in heated grape-houses, which will secure both color and flavor. Thin the forming bunches in cold houses, and remove defective or diseased berries, and avoid cold currents of air.

AUGUST.

This month is chiefly to be occupied with a continuance of the labors of the past. Destroy weeds; keep the ground mellow about young trees; pinch off shoots that are becoming too long in young trees and blackberry bushes; mulch trees that are suffering from

drouth, and transplant strawberries according to directions on p. 412.

Watch for insects, especially plant-lice, which often increase rapidly during the month. Destroy the latter with strong soapsuds or very strong tobacco-water. Keep a constant eye for black-knot on the plum and fire-blight in the pear, and instantly cut off all affected parts.

Continue budding—finishing cherry, plum, and standard pear, and beginning early on apples. Mahalebs, peaches, and quinces may be budded towards the close of the month. Watch budded stocks and remove ligatures as soon as they cut the bark.

Gather early pears for house-ripening.

September.

Complete the budding of peaches and quince stocks, and timely remove the ligatures. Keep new strawberry beds entirely free from weeds; and unless intended for increasing the plants, cut off the runners. Prune out the useless wood of young trees, and give a good shape to the forming heads—growth being now nearly terminated, no check will be given to the tree.

Prepare the ground for new orchards and fruit-gardens, see pp. 54, 129.

Top-dress orchards, as circumstances require, according to the directions on p. 76.

October.

Transplanting may be commenced during the present month—see full directions in the chapter on this subject, p. 58.

The chief remaining work is gathering fruit. Carefully hand-pick all good specimens, and avoid rubbing and bruising. Autumn pears should be picked a few days before maturity; winter varieties are to be left on the trees as long as they can safely remain without danger of freezing. For a convenient mode of gathering apples, see page 109 of this work. Apples intended for market should be very carefully handled, never dropped or bruised, and assorted into at least three qualities, namely, extra, medium, and poor—the latter to be used for culinary purposes and feeding animals. By this process the selected fruit will sell for more than the whole would unassorted; and the owner will acquire a reputation in market which will enable him to sell at high prices in the most abundant seasons.

For directions in gathering and keeping grapes, see p. 113.

Top-dressing orchards may be performed any time during the month.

Grape-vines in green-houses should have their growing shoots pinched in ; and vines in cold houses, as soon as the fruit is picked, should be thrown open and exposed to the air.

November.

Transplanting may be continued at any time during mild weather, so long as the ground remains open and the air is not freezing. Register in a book the name of every tree set out, and this record may be referred to in future years when the labels have gone. Young trees in windy places should be either staked, or stiffened against the wind by a mound of earth, p. 62. Mice may be excluded from young trees by small conical mounds a foot high, made smooth and perfectly compact, carefully excluding turf from them.

Trees received late from a distance may be heeled in for spring planting, as directed on pp. 64, 65.

Protect half hardy raspberries by bending down and covering slightly with earth. Cover strawberry beds with coarse stiff straw, or with cornstalks or evergreens. Grape layers should be separated from the vine and pruned, and packed away in moss, or heeled in the earth.

Cuttings of quinces, gooseberries, and currants should be made and treated in the same way. Cut grafts for spring use, carefully labelling each sort and packing away for winter, p. 37. Stocks for root-grafting are to be taken up and packed in boxes in cellars for winter use.

Plough between nursery-rows, to carry off surplus water in winter.

December.

Examine the directions for last month, and promptly complete all jobs not finished in season. Finish cutting grafts ; apply winter mulching to young trees ; collect stakes, tallies, labels, etc., which are out of use, and tie up and pack them away. Examine the directions for January, and perform any work which may be in season.

Grape-houses.—In early houses the vines pruned last month will begin to swell their buds. Give a regular and moderate temperature during the present month. Prune vines in green-houses and cold houses, and protect the latter with a covering of leaves.

Descriptive List and Index of Fruits.

[The following lists contain the names of the more common or well known varieties of fruit, either local or widely disseminated, with brief notices of those not described in the body of the work. A few are new sorts of high promise, which, when tested, may yet take their places among standard varieties. It will be understood that when reference is made from one name to another, the latter is a synonym of the former.]

APPLES.

Abbott, or Abbott's Sweet. Medium, roundish, striped; of moderate flavor. Winter. N. H.

Abbott's Sweet. Medium, roundish conic; striped, good. Winter. N. H.

Abram. Rather small, roundish, yellow and red; sub-acid, good. Winter. Va. and N. C.

Acuba-leaved Reinette. Medium, oblate, red and yellow; tender, sub-acid, good.

Adams. Large, oblate, faintly striped; flesh greenish white, of pleasant flavor. Union Co., Pa. Winter.

Adams Pearmain. Medium, conical, greenish yellow and grey russet; flesh yellowish, aromatic. Early winter. Foreign.

Agnes. Rather small, flattened, striped; spicy, sub-acid, good. Late summer. Pa.

Ailes, p. 212.

Albemarle Pippin of Va. See Yellow Newtown Pippin.

Alexander, p. 199.

Alfriston. Large, roundish oblong, ribbed, green; sub-acid, of moderate quality. Autumn. Foreign.

All-summer Apple. Rather small, roundish, greenish white; flesh white, crisp, pleasant. July, August. Pa.

Allen's Choice. Medium, roundish oblate, striped; coarse, aromatic, good. Winter. Pa.

Allum. (Hallum, Rockingham Red.) Medium, oblate, irregular, red; brisk acid. Long keeper. North Carolina.

American Beauty, or Sterling Beauty. Medium, roundish, deep red; rich, vinous. Winter. Mass.

American Golden Pippin, p. 226.

American Golden Russet. See Bullock's Pippin.

American Pippin, or Grindstone. Medium, roundish oblate, regular, dull red; very hard, dry. Long keeper.

American Red Juneating. See Early Strawberry.

American Summer Pearmain, p. 190.

Angle. Medium, roundish, striped; sweet. September.

Anglo-American. Medium, roundish conic, striped; sweet, aromatic, very good. Late summer. Canada West.

Api. See Lady-Apple.

Arbroath Pippin. See Oslin.

Aromatic Carolina, p. 190.

Ashland. Medium, roundish oblate, striped dull red; mild sub-acid. Early winter.

Ashmore, or Red or Striped Ashmore. Rather large, roundish oblate, red; crisp, sub-acid. Autumn. Showy—market. Ohio Valley.

August Apple. See Early Pennock.

Augustine. Large, roundish conic, striped; sweet, dry. August.

Aunt's Apple. Rather large, roundish, striped; sub-acid, musky, good. Early winter.

Aunt Hannah, p. 224.

Austin Sweet. Medium, roundish, yellow, rich, sweet, very good. Autumn. Pa.

Autumn Bough, p. 198.

Autumn Pearmain, or Winter Pearmain. Rather small, roundish oblong, dull red, stripes small; crisp, dry, rich, and high flavored. Autumn and early winter.

Autumn Pippin. Rather large, oblong conic, with a brownish cheek; pleasant, sub-acid. Early winter.

Autumn Seek-no-further. Medium, roundish oblate, green, faintly striped; juicy, tender, sub-acid, very good. October.

Autumn Strawberry, p. 203.

Autumn Sweet Bough, p. 198.

Autumnal Swaar, p. 197.

Averill. Rather large, conic, irregular, ribbed, striped; pleasant, sub-acid. Long keeper. Conn.

Bachelor. See Red Winter Pearmain.

Bachelor's Blush. Rather large, oblate, stalk very short, greenish yellow with a blush; rather acid, good. August.

Baer, p. 212.

Bagby Russet, or Egyptian Russet. Medium, slightly conic, light russet on yellow; tender, fine-grained, juicy, sub-acid, aromatic, rich, excellent. Winter. Ill. Hort. Soc.

Bailey's Golden. Large, oblong, yellowish, slightly russeted; flesh white, pleasant, sub-acid. Winter. Maine.

Bailey's Spice, p. 206.

Bailey Sweet, p. 209.

Baker. Large, roundish, striped crimson, rather coarse; pleasant, sub-acid, very good. Productive and profitable. Conn.

Baker's Sweet, or Winter Golden Sweet. Medium, roundish, rich yellow; rather coarse, rich. Early winter. Conn.

Baldwin, p. 212.

Baltimore. Medium, roundish, striped purplish red; sub-acid, very good. Winter.

Baltimore Pippin. See Fallawater.

Baltzley. Large, oblate, yellowish white; firm, almost sweet. Oct. Va.

Barbour. Medium, roundish oblate, striped; pleasant, very good. Pa.

Barrett. Rather large, conical, striped red on yellow; pleasant, aromatic, nearly sweet. Winter. Conn.

Bars. Rather large, roundish, pale yellow, marbled red; mild, pleasant, rich. Late summer. Rhode Island.

Bean Sweet. Medium, oblong ovate, white, handsome; crisp, juicy—baking. Autumn and winter. Little known.

Beauty of Kent, p. 199.

Beauty of the West. Large, roundish, regular, striped; sweet, pleasant, of moderate flavor. Autumn.

Bedfordshire Foundling. Large, roundish, green; pleasant, acid—cooking. Autumn and winter. English.

Beef Steak, or Garden Apple. Medium, oblate, somewhat oval, striped; mild, pleasant, sub-acid. Autumn. Mass.

Belden Sweet. Rather small, conic, angular, yellow with a blush; flesh white, pleasant, aromatic. Winter. Conn.

Belle et Bonne, p. 224. [Another Belle Bonne (called also Billy Bond) is cultivated in Western New York, and is a medium, roundish-conic, striped apple, rather coarse, and good for cooking.]

Belle-Fleur. See Bellflower.

Belle-Fleur Rouge, or Red Bellflower. Large, oblong conical, striped; of moderate or poor flavor. Winter.

Bellflower. See White and Yellow Bellflower.

Bell's Early. See Sops of Wine.

Bell's Scarlet Pearmain. See Scarlet Pearmain.

Belmont, p. 224.

Belzer. Medium, striped red on greenish yellow; flesh white, sub-acid. August. Ohio.

Ben. See Eustis.

Ben Davis, p. 212.

Benoni, p. 190.

Bentley's Sweet, p. 209.

Berry, or Red Hazel. See Nickajack.

Bethlehemite, p. 213.

Betsey's Fancy. Rather small, oblate, yellow, shaded dull red; mild sub-acid. Winter.

Better than Good, or Juicy Bite. Medium, oblate, pale yellow; tender, mild, sub-acid. Early winter. Pa.

Bevan, or Bevan's Favorite. Medium, roundish oblate, striped red and yellow; flesh firm, sub-acid. Late summer. N. J.

Billy's Pippin. Large, round ovate, red on yellow; sub-acid, rich, very good. Autumn.

Black Apple. See Jersey Black.

Black Coal. Rather large, roundish, irregular, dark red with white dots; flesh white, a little stained, rather acid. Early winter. Western.

Black Detroit, p. 215.

Black Gilliflower, p. 213.

Black Lady Apple, resembles the Lady Apple in size and form, but is nearly black, and has a poor flavor.

Black Oxford. Below medium, roundish oblate, dark red; flesh compact, not juicy, mild sub-acid. Valued as a good bearer and keeper. Maine.

Black's Annette. Small, roundish, dark red. Autumn. Kentucky.

Blake. Rather large, roundish, greenish yellow; crisp, juicy, good. Oct. to Jan. Maine.

Blakely. Large, oblate, regular, yellow with a sunny cheek; flesh mild sub-acid, pleasant. Winter. Vt.

Bledsoe, or Bledsoe Pippin. Very large, oblate, regular, somewhat conic, striped; flesh white, fine grained, pleasant, sub-acid. Winter. Ky.

Blenheim Orange, or Blenheim Pippin. Medium, roundish, striped dull red; flesh yellow, breaking, sweet, flavor moderate. Autumn. English.

Blockley. Rather large, roundish oblate, ribbed, yellow; flesh yellowish, compact.

Blood. Medium, roundish, ribbed, striped dull red; breaking, mild, good. Winter. Ohio.

Blue Pearmain, p. 213.

Blue Sweet. Medium, roundish, slightly conical, striped dull red; flesh white, fine, not juicy. A long keeper. Mass.

Blush June. See Carolina Red June.

Boalsburg. Large, oblong, slightly conical, striped; flesh yellow, with a very good refreshing flavor. Winter. Pa.

Boas. Medium, roundish, oblate, striped; good. Late winter. Pa.

Bohannan. Medium, roundish, slightly conic and flattened; yellow with red cheek; tender, juicy, sub-acid, of moderate flavor. July and August. South-western. Popular.

Bonum, p. 199.

Borovitsky. Medium, roundish, striped; firm, sub-acid. August. Russian.

Borsdorff. Small, roundish oval, yellow with a red cheek; flesh firm, crisp, rich, brisk, perfumed. Early winter. German.

Boston Russet. See Roxbury Russet.

Bough. See Sweet Bough.

Bourassa. Medium, roundish conic, rich orange russet, tender, aromatic, good. Early winter.

Bowker. Medium, roundish oblate, yellow and crimson; tender, sub-acid. Autumn.

Bowling's Sweet. Medium, roundish, dull red; rich, sweet. October to January. Va.

Boxford. Medium, oblate, striped, not juicy nor high flavored. Autumn.

Brabant Bellflower. Large, roundish oblong, striped; rich, sub-acid. Late autumn. Holland.

Brenneman. Medium, striped; flesh white; sub-acid—cooking. Late summer. Pa.

Brewer. Very large, roundish, yellow; flesh yellowish; pleasant, sub-acid. Autumn. Mass.

Briggs' Auburn. Large, oblate, light yellow; sub-acid. September, October. Me.

Brittle Sweet. Rather large, roundish; crisp, sweet, very good. Autumn.

Broadwell, p. 211.

Brookes' Pippin, p. 224.

Buchanan's Pippin. Medium, oblate yellow, shaded maroon; flesh greenish; crisp, refreshing, sub-acid. Late winter. Ohio.

Buck Meadow. Above medium, roundish, streaked; sub-acid, rather rich. Winter. Conn.

Buckingham, p. 199.

Bucks County Pippin. Large, roundish, slightly oblate and oblique, greenish yellow; firm, slightly sub-acid. Pa.

Buff, p. 213.

Buffington's Early. Rather small, oblate, light yellow; fine, sub-acid, excellent. Summer. A poor bearer.

Bullet, p. 213.

Bullock's Pippin, p. 225.

Buncombe or Bunkum. See Red Winter Pearmain.

Burnhap Greening. Medium, roundish, greenish yellow; crisp, sub-acid. Early winter. Vt.

Burr's Winter Sweet. Medium, oblate, striped; aromatic. Winter. Mass.

Bush. Rather large, oblate, greenish yellow; pleasant. September. Pa.

Butter. Rather large, roundish oblong, yellow, fair; sweet, rich—cooking. Autumn. Pa. Several of this name.

Byram's Sweet. Medium, oblate, yellow; sweet, pleasant flavor. Oct.

Cabashea. Very large, oblate, striped dull red; coarse; sub-acid. Early winter.

Cabbage-head. Large, yellow, coarse, crisp, sub-acid. Good. Vigorous and productive. N. J.

Cain, or Cane. See Kane.

Calet's Sweet. Large, roundish, yellow; sweet, rich. November to January. N. H.

Callasaga. See Cullasaga.

Camak's Sweet, p. 211.

Campfield, or Newark Sweeting. Medium, roundish oblate, smooth, striped; firm, not juicy; rich, sweet. Keeps long. N. J.

Canada Reinette, p. 225.

Cann, or Sweet Cann. Large, conic, greenish, dull cheek; sweet, pleasant. Winter.

Cannahan's Favorite, p. 214.

Cannon Pearmain, p. 214.

Capron's Pleasant, p. 206.

Carnation, p. 199.

Carolina Red June, p. 190.

Carolina Spice. See Nickajack.

Carolina Winter Queen, p. 214.

Caroline. Medium, oblate, ribbed, maroon, mild sub-acid. Winter. N. J.

Carter, p. 214.

Carter of Virginia. Medium, yellowish, tender, juicy, pleasant.

Carthouse, p. 214.

Cash Sweet. Medium, oblate, conic, whitish; flesh sweet, dry. September.

Cat-head. Very large, round, pale green, sub-acid. Valueless except for cooking. Autumn. Foreign.

Cat-head Greening. See Cat-head.

Cat-head Sweet. Large, roundish conic, greenish yellow; sweet, not rich. October.

Catline. Small, oblate, striped; rich, sweet. Autumn. Del.

Catooga. Quite large, irregular, yellow; sub-acid. Winter. Southern.

Cat Pippin. Rather large, greenish; sub-acid. Winter. Western Pa.

Cattall Apple. See Meyer's Nonpareil.

Cayuga Red Streak. See Twenty Ounce.

Caywood. Medium oblate, bright yellow; firm, not juicy, nor rich. Keeps into Summer. Ulster Co., N. Y.

Challenge. Large, oblate, deep yellow; crisp, tender, sweet. Good through winter. Great bearer. Ohio.

Champlain. See Summer Pippin.

Chandler, p. 214.

Charles Apple. See Male Carle.

Chattahoochie. Rather small, greenish yellow; crisp, sub-acid, pleasant. Winter. Georgia.

Cheeseborough Russet. Large, conical, greenish russet; sub-acid, dry. Of little value. Autumn.

Chenango Strawberry, p. 199.

Chester. Medium, oblate, whitish yellow, carmine dots; crisp, tender, sub-acid. Good. Early winter. Pa.

Chief Good. Rather large, roundish, red on light yellow; flesh white, sub-acid, aromatic. September, October. Ky.

Churchill Greening. Large, oblate conic, ribbed, dull red on yellowish green; rich, vinous. Winter.

Claremont Pippin. See Easter Pippin.

Clarke's Pearmain, p. 225.

Clyde Beauty, or Mackie's Clyde Beauty. Large, roundish conic, greenish with a red cheek; tender, juicy, sub-acid. Late autumn. Productive, valuable, new.

Cocklin's Favorite. Small, roundish, flattened at ends. Good. Pa.

Cogswell, p. 214.

Cole, or Scarlet Perfume. Large, roundish conic, crimson; quality moderate. Summer. English.

Cole's Quince, p. 194.

Colvert. Large, oblate, striped; sub-acid, quality moderate—culinary. Autumn. Succeeds well north-west.

Conant's Sweeting. Medium, light yellow; good. Productive.

Congress. Large, yellow and striped; coarse, acid. Good. Nov. Mass.

Connecticut Seek-no-further. See Westfield ditto.

Connett's Sweet. Large, roundish oblate, dark red on rich yellow; sweet. Very good. December to March.

Conway. Medium, oblate, greenish yellow; crisp, rich, aromatic. January to February.

Cooper, p. 199.

Cooper's Early White. Medium, roundish, pale yellow; crisp, sprightly. Autumn. Western.

Cooper's Red, Cooper's Market, or Cooper's Redling, p. 214.

Corlies' Sweet. Medium, light yellow; firm, sweet. Good. Great bearer. Oct.

Cornell's Fancy, or Cornell's Favorite, p. 200.

Cornish Aromatic. Medium, roundish, ribbed, red; rich sub-acid, aromatic. Autumn. English.

Cornish Gilliflower, or Red Gilliflower. Rather large, conic, ribbed; dull stripes; flesh yellow, firm, very rich, aromatic. Winter. English. A poor bearer.

Cos or Caas. Large, roundish conic, one-sided, striped; mild, agreeable. Winter. Kingston, N. Y.

Court Pendu Plat. Medium, oblate, regular, deep red; rich, brisk sub-acid. Early winter. French.

Court of Wick. Small, roundish ovate, approaching oblate, greenish yellow and orange; crisp, juicy, rich. Fails here. Autumn. English.

Cracking, p. 200.

Cranberry Pippin. Medium, oblate, with a handsome scarlet cheek; sub-acid, poor—cooking. Productive. Autumn. N. Y.

Crimson Pippin. See Black Detroit.

Cullasaga, p. 214.

Culp. Medium, conic, ribbed, irregular, yellow with a blush; firm, vinous. Winter. Ohio.

Cumberland, or Cumberland Seedling. Large, roundish, oblate; flesh white, sub-acid—market. Pa.

Cumberland Spice, p. 226.

Curtis Sweet. Large, oval, ribbed, striped red on pale yellow; tender and pleasant. August to October.

Danvers Winter Sweet, p. 211.

Darlington Russet. Medium, roundish; of moderate quality. A good keeper. Ohio.

Dartmouth. Medium, yellow; sweet, good. Oct. Mass.

Davis. Small, oblong, flattened, crimson; crisp, sub-acid. Good keeper. Mich.

De Bretagne. See Canada Reinette.

Delight. Medium, roundish oblate, russet and crimson; flesh firm, nearly sweet. Very good. Winter. Southern Ohio.

Democrat. Medium, roundish conical, striped with crimson; mild, pleasant, sub-acid. Very good, productive. Western New York.

D'Espagne. See White Spanish Reinette.

Derrick's Graft. See Richard's Graft.

Derry Nonsuch. Rather large, oblong, conic, angular, striped; sub-acid, agreeable. Winter. N. H.

Detroit, p. 215.

Devonshire Quarrenden. Medium, roundish oblate, crimson; crisp, sub-acid. Late summer. English.

De Witt. See Doctor.

Dickson's Emperor. Large, irregular, red; good. Winter. Scotch.

Dillingham. Medium, roundish conic, greenish yellow; sweet. Early winter. Sandusky, Ohio.

Disharoon, p. 206.

Doctor, p. 200.

Domine, p. 200.

Douse or Dows. See Hawley.

Downing's Paragon. Rather large, oblong, oval, light yellow; sweet, aromatic. Autumn. Illinois.

Downton Pippin. Small, roundish oblate, yellow; rich, sub-acid. Autumn. English.

Drap d'Or, p. 200.

Duchess of Oldenburgh, p. 200.

Duckett, p. 200.

Dutch Codlin. Large, roundish oblong, irregular, yellow; sub-acid—cooking. August to September.

Dutch Mignonne, p. 215. [Dutch Mignonne of later authors is only medium in size, striped; tender, juicy, sub-acid. Winter.]

Duzenbury. Medium, striped; crisp, tender, mild sub-acid. Very good, very productive, keeps into spring. Putnam Co., N. Y. New.

Dyer, p. 200.

Early Crofton. See Irish Peach.

Early French Reinette. See Early Harvest.

Early Harvest, p. 195.

Early Joe, p. 190.

Early Long Stem. Small, oblong conic, greenish yellow; sub-acid, aromatic. August.

Early May. See White Juneating.

Early Pennock, p. 191.
Early Red Juneating. See Early Red Margaret.
Early Red Margaret, p. 191.
Early Spice. See Early Long Stem.
Early Strawberry, p. 191.
Early Summer Pearmain. See American Summer Pearmain.
Early Summer Pippin. See Drap d'Or.
Early Sweet. Medium, roundish, oblique, yellow; tender, sweet. Very good. July and August. Ohio.
Early Sweet Bough, p. 190.
Easter Pippin. Medium, green; firm, dry, sub-acid, good. Keeps two years.
Edgerly Sweet. See Bailey's Sweet.
Edwards. See Nickajack.
Egg-Top. Medium, oblong oval, striped, handsome; sub-acid, of moderate quality. Autumn.
Egyptian Russet. See Bagby Russet.
Eighteen Ounce. See Twenty Ounce.
Ellis. Small, roundish, greenish yellow; firm, pleasant—long keeper. Conn.
Elton Pippin. See Downton Pippin.
Emperor Alexander. See Alexander.
Enfield Pearmain. Rather small, round, deep red; mild, rich. Early Winter.
English Codlin. Rather large, oblong conic, yellow; sub-acid—cooking. Summer and Autumn.
English Golden Pippin. Small, roundish, yellow; flesh yellow, with a rich, sub-acid flavor. Winter. English.
English Nonsuch. See Nonsuch.
English Red Streak. See Red Streak.
English Russet, p. 226.
English Sweeting. See Ramsdell's Sweeting.
English Vandervere. See Smokehouse.
Episcopal. See Fall Pippin.
Epse's Sweet. See Danvers Sweet.
Epsy. Small, long conic, deep red; sweet, rich, handsome. Productive. Early Winter. Vt.
Equinetely. See Buckingham.
Ernst's Pippin, p. 205.
Esopus Spitzenburgh, p. 222.
Esten, p. 201.
Excel. Large, oblate, ribbed, red on yellow; rich, sub-acid. Winter. Conn.
Eve. See Early Red Margaret.
Evening Party, p. 215.
Ewalt. Medium, flattened, greenish yellow, and a red cheek; tender, pleasant, perfumed, very good. April. Pa.
Eustis, p. 215.
Exquisite. Below medium, oblate, striped; juicy, rich, pleasant. Autumn. Illinois.

Fairbanks. Medium, oblate conic, striped; rich. Autumn. Maine.
Fallawater, p. 226.
Fall Bough. See Autumn Bough.
Fall or Summer Cheese. Resembles Winter Cheese, but earlier. Va.
Fall Harvey, p. 207.
Fall Jenneting. Rather large, oblate, greenish yellow; sub-acid, pleasant—cooking. November. A great bearer.
Fall Orange, p. 207.

Fall Pearmain. Medium, roundish conic, striped; rich sub-acid. Autumn. Ct.

Fall Pippin, p. 207.

Fall Queen of Kentucky. See Buckingham.

Fall Seek-no-further, p. 201.

Fall Stripe. See Saxton.

Fall Wine, p. 201.

Fameuse, p. 201.

Family. Medium, striped; mild sub-acid, very good. August. Ga. Productive.

Fanny. Large, roundish, deep crimson; pleasant, sub-acid, very good. August. New. Pa.

Farley's Red. Oblong oval, striped; firm, pleasant. Winter. Ky.

Father. Medium, greenish yellow; very tender, sub-acid, good. November. Ontario County, N. Y.

Father Abraham. Small, flat, red; flesh white, pleasant. Keeps well. Va. and Ky.

Faust. Medium; sub-acid, good. Nov. N. C.

Fay's Russet. Rather small, conic, yellow russet and red; flesh white, pleasant, sub-acid. Spring. Vt.

Fenley. Large, oblate, irregular, yellowish white; very good. September. Ky.

Fenouillet Gris. Small, roundish, yellow and russet; firm, rich, perfumed. Winter. Foreign.

Fenouillet Rouge. Small, roundish, rough, brownish red; firm. Autumn. Foreign.

Ferdinand. Large, oblate, irregular, greenish yellow. Winter. S. C.

Ferris. See R. I. Seek-no-further.

Fisk's Seedling. Medium, oblate, oblique, deep red; flesh greenish white, tender, rich. Autumn. N. H.

Flakes Fall. Large, striped; mild sub-acid, aromatic. Market. October. Pa.

Flat Pippin. See Pittsburgh Pippin.

Fleiner. Medium, oblong, yellow; sub-acid, of moderate quality. A great bearer. Autumn. Foreign.

Flower of Kent. Large, roundish conic, red and yellow; sub-acid—cooking. Late autumn. English.

Flushing Seek-no-further. See Green Seek-no-further.

Flushing Spitzenburgh, p. 215.

Ford Apple. Large, roundish, yellow; rich, rather acid. Autumn. N. Y.

Formosa Pippin. See Ribston Pippin.

Fort Miami. Medium or large, roundish oblong, ribbed, brownish and russeted; sub-acid, spicy. Winter. Ohio.

Foster, p. 189.

Foundling, p. 191.

Fourth of July. Medium, roundish conical, striped, light red; acid, good. Good early cooking apple.

Franklin Golden Pippin. Medium, oval, regular, deep yellow; rich, aromatic. Autumn.

French Pippin. Rather large, oblate, sometimes oblique, yellow; tender, rich, sub-acid, very good. Late autumn. N. J. The slender branches of the Newark Pippin distinguish it from this variety.

French's Sweet. Large, round ovate, greenish yellow; firm, perfumed, very good. Late autumn. Mass.

Fronclin. Medium, round, bright red; rather acid. Great bearer. Pa.

Fulton, p. 226.

Gabriel, p. 202.
Garden. Small, striped; sub-acid, good. Nov.
Garden Royal, p. 192.
Garden Sweet. Medium, oblong, yellow; juicy, tender, sweet, good. September, October. Hardy and productive.
Garretson's Early, p. 195.
Gate. See Belmont.
Genesee Chief. Large, roundish conic, ribbed, whitish with red cheek; sub-acid—cooking.
Geneva Pippin. See Winter Pippin of Geneva.
Giles. Medium, conic, dark red. Ct.
Gillett's Seedling. See Rome Beauty.
Gilpin, p. 214.
Gipson's Kentucky Seedling. Rather small, round ovate, dark red and greenish yellow; sub-acid. Productive. Long keeper. Ky.
Gloria Mundi. See Monstrous Pippin.
Glory of York. See Ribston Pippin.
Gloucester Cheese. See Fall Cheese.
Gloucester Pearmain. See Clarke's Pearmain.
Gloucester White. Medium, roundish oblate, yellow; rich, aromatic. Autumn. Va.
Goble Russet. Medium, oblong, russet, reddened; dry, sweet. Autumn.
Golden Ball, p. 226.
Golden Goss. Round oblate, ribbed, yellow; good.
Golden Harvey. Small, roundish, rough, russety orange; rich sub-acid. Winter. English.
Golden Pippin. See English Golden Pippin.
Golden Pippin of Westchester Co., p. 226. [Another Golden Pippin, called also Pound Royal and Mammoth, is very large, yellow; coarse, good. Late autumn. There are still others of this name.]
Golden Pearmain. See Clarke's Pearmain.
Golden Reinette. Small, roundish, regular, yellow and orange striped; rich, mild sub-acid. Late autumn. English.
Golden Russet of New York, p. 227.
Golden Spice. See Dyer.
Golden Sweet, p. 189.
Golden Wilding. Medium, oblate, rich yellow; crisp, acid, good. N. C.
Grandfather. Medium, roundish, oblate conic, striped and whitish; pleasant, sub-acid. Autumn.
Granniwinkle. Medium, roundish oblong, red; sweet—for cider only. Autumn. N. J.
Granny Earl. Small, roundish oval, greenish, striped. Early winter.
Grand Sachem. See Black Detroit.
Granite Beauty, p. 215.
Grape Vine. See Camak's Sweet.
Gravenstein, p. 202.
Greasy Pippin. See Lowell.
Green Cheese. See Winter Cheese.
Green's Choice. Medium, roundish conic, striped; nearly sweet. Late summer. Pa.
Green Domine. Medium, oblate, dull red; firm, pleasant. Early winter.
Greenskin. Medium, oblate, greenish yellow; tender, rich. Early winter. Southern and Western.
Green Mountain Pippin, of Ga. See Virginia Greening.
Green Newtown Pippin, p. 228.

Green Seek-no-further, p. 227.
Green Sweet, p. 211.
Green Winter Pippin. See Newtown Pippin.
Green Vandevere. See Vandevere.
Gregson. See Catline.
Grey Apple. See Pomme Grise.
Greyhouse. Medium, roundish, dull red; firm, dry—for cider. Winter. N. J.
Grey Pippin. See Buel's Favorite.
Grey Vandevere. See Vandevere.
Grimes' Golden Pippin, p. 227.
Grindstone. See American Pippin.
Groton. See Foundling.
Gully. Rather small, white with a blush. Pa.

Hagloe Crab. Small, distorted—for cider only.
Hague Pippin. Large, conical, striped deep red, handsome. January. Western.
Hain. Large, roundish oblong, striped; sweet, aromatic. Winter. Berks Co., Pa.
Hall, p. 215.
Hall's Red. See Hall.
Hallum. See Allum.
Harmony. See Early Pennock.
Harnish. Medium, oblong oval, dark red; compact, rather dry, sweet. Autumn. Pa.
Harrigan. See Milam.
Harris. Large, oblate, yellow; coarse, pleasant, sub-acid. Early autumn. For cooking. N. C.
Harrison. Medium, roundish oblong, yellow; dry, tough, rich—for cider. N. J.
Hartford Sweeting, p. 209.
Harvest Red Streak. Medium, oblate, striped; coarse, acid—cooking. Late summer.
Haskell Sweet, p. 198.
Haas or Fall Queen. Medium, oblate conic, striped with red; flesh white, juicy, acid, rich, very good. Autumn. Popular at the Southwest. Distinct from Horse Apple.
Hawley, p. 207.
Hawthornden. Rather large, oblate, regular, pale yellow; pleasant, sub-acid—for cooking. Great bearer. Autumn.
Hay's Winter. See Wine.
Heart's Pippin. Medium, roundish, yellow; tender, acid—cooking. November.
Hector. Large, oblong conic, striped; pleasant, very good. Winter. Pa.
Heicke's Winter Sweet. See London Sweet.
Helen's Favorite. Medium, roundish, dark red; flesh white, good. Winter. Ohio.
Henrick Sweet. Medium, conic oblate, red; sweet, not rich. Winter.
Henry. Large, oblong conic, yellow; rich, pleasant. Late autumn. Vt.
Henwood Seedling. Large, oblong oval, greenish yellow; good. January. Western.
Hepler. Medium, oblate conic, light yellow, shaded dull red; not rich or juicy, sub-acid. Winter. Pa.
Herefordshire Pearmain, p. 216.
Herman. Medium, oblong conic, striped; flesh greenish, sub-acid, very good. Winter. Pa.
Hess, p. 216.
Hewes' Virginia Crab. Small, round, dull red; fibrous; acid, astringent—for cider only.

Hewitt's Sweet. Large, oblate, yellow and red; sweet. Autumn.
Hicks. Medium, roundish, yellow, slightly striped; juicy, rich; sweet, very good. August. Long Island.
Hiester, p. 212.
Higby's Sweet, p. 211.
Highlander. Medium, oblate, slightly conic, green, striped with red; pleasant. Autumn. Vt.
Hightop Sweet, p. 189
Hill's Favorite. Medium, roundish, red; compact, sub-acid, aromatic. Autumn. Mass.
Hilton. Large, roundish, yellowish green; sub-acid—cooking. Autumn. N. Y.
Hinckman. See Newark King.
Hoary Morning. Large, oblate conic, striped; sub-acid—cooking. Autumn. English.
Hockett's Sweet, p. 209.
Hocking, p. 192.
Hog Island Sweet. Medium, oblate, fine red; sweet, rich, very good. Autumn. Productive. N. Y.
Holden Pippin. See Fall Orange.
Holladay's Seedling. Medium, oblate, yellow; rich, aromatic. Winter. Va.
Holland's Red Winter. See Winesap.
Holland Pippin, p. 206.
Hollow Core Pippin. See Ortley.
Hollow Crown, p. 216.
Holman. Large, roundish conic, splashed red, sub-acid, good. Early winter. N. C.
Homony. See Sops of Wine.
Honey Greening, p. 211.
Hooker. Medium, conic, striped; flesh greenish; sub-acid. December. Conn.
Hoover. Large, roundish, rich crimson with large whitish dots; brisk acid. Early winter. S. C.
Horse, p. 195.
Horse Block. See Manomet Sweet.
Housom's Red. Large, oblong, striped; tender, aromatic, very good. October to February. Pa.
Howe's Russet. Closely resembles Roxbury Russet. Mass.
Hubbardston Nonsuch, p. 216.
Hubbardton Pippin. Large, roundish, variable, striped; crisp, pleasant, sub-acid. Winter. N. H.
Hughes, p. 227.
Hunge, p. 206.
Hunter. Medium, roundish conic, striped bright red; flesh white. October. Pa.
Hunt's Connecticut. Large, round oblate, yellow and dull red; dry, breaking; sub-acid, good. Winter.
Huntsman's Favorite. Large, oblate, yellow; crisp, mild sub-acid, aromatic, very good. Winter. Good market sort. Missouri.
Hunt's Russet. Small, conic, russet and dull red; fine, sub-acid. Winter. Mass.
Hurlbut, p. 202.
Hutchison. Medium, roundish, yellow and red, mild, sub-acid, or nearly sweet. Good. Winter. A handsome long keeper. Ky.
Hyde's Sweet. See Wood's Sweet.

Indian Queen. See Early Pennock.
Indiana Favorite, p. 217.
Indiana Jannetting. See Rawle's Janet.
Irish Peach Apple. Medium, roundish, striped, brownish red; flavor tolerable. August.

Jabe. Medium, flattened, yellow with a red-cheek; tender, juicy, melting, rich. Hardy and productive. September to November.

Jabez Sweet. Medium, roundish, dull red; sweet. Winter. Conn.

Jackson. Medium, roundish, greenish yellow; aromatic, very good. Winter. Pa.

Jackson Red. See Nickajack.

James River. See Limber Twig.

Jefferis, p. 202.

Jefferson. Rather large, roundish conic, splashed dull red; sub-acid, very good. Good keeper. Ky.

Jefferson County, p. 202.

Jeniton. See Rawle's Janet.

Jenkins. Small, roundish ovate, red with white dots; pleasant, aromatic. Very good. Winter. Pa.

Jennette. See Rawle's Janet.

Jenny's Seedling. See Small.

Jersey Black. Medium, roundish, regular, dark red; nearly sweet, good. Tree vigorous, very productive. Valuable for market. Western. Early winter.

Jersey Greening. See Rhode Island Greening

Jersey Pippin. Medium, oblong conic, striped; sub-acid, good. December. Foreign.

Jersey Sweeting, p. 197.

Jewett's Best. Large, roundish or oblate, deep red, flesh yellow, juicy, rich, sub-acid. Early winter. Vt.

Jewett's Red, p. 202.

Joe Berry. See Newtown Spitzenburgh.

John's Sweet. Medium, oblong or conic, striped red on whitish yellow; sweet, of a peculiar flavor. Winter. N. H.

Johnson. Rather large, roundish conic, striped; tender, sweet, becoming mealy. Late summer. Conn.

Johnson's Fine Winter. See Imperial York.

Jonathan, p. 217.

Jones Pippin. See Fall Orange.

Juicy Bite. See Better than Good.

Julian, p. 192.

Julin. See Julian.

July Pippin. See Early Harvest.

Junaluska. Large, roundish conic, yellow; flesh yellow; sub-acid. Winter. N. C.

Kaighn's Spitzenburgh. Large, oblong, approaching ovate, red; coarse, crisp, sub-acid. Early winter.

Kane, p. 203.

Keiser, p. 217.

Keim. Rather small, oblong oval, yellow, sub-acid, aromatic, delicate, very good. Winter. Pa.

Keister. Small, roundish conic, striped; pleasant, very good. October. Pa.

Kelly's Sweet. See Moore's Sweet.

Kelly White. See Belmont.

Kelsey. Medium, roundish oblate, greenish yellow; flesh greenish white, tender, pleasant, aromatic, very good. March. Pa.

Kenrick's Autumn. Large, roundish, striped; sprightly sub-acid. September.

Kentish Fill-Basket. Very large, roundish, yellow, slightly streaked; sub-acid—cooking. October, January. English.

Kentucky. Large, roundish, yellow and dull red; juicy, tender, sub-acid, good. Great bearer. October.

Kentucky Cream. Medium or above, roundish, largest at apex, yellow and red; mild sub-acid, good. Winter. N. Y.

Kerry Pippin. Medium, oval, yellow; crisp, rich. Autumn. Irish.

Keswick Codlin, p. 206.

Ketchum's Favorite. Medium, oval conic, yellow with a blush; mild, rich, very good. Autumn. Vt.

Kilham Hill. Rather large, roundish, striped; good at first, becoming mealy and worthless. September. Mass.

King of Tompkins Co., p. 217.

King of the Pippins. Medium, roundish oblate, striped; rather poor. English.

King Philip. See Jonathan.

Kingsbury Russet. See Cheeseborough Russet.

Kingsley. Medium, roundish oval, striped; sub-acid, very good. Winter and Spring. Monroe Co., N. Y.

Kirkbridge White, p. 195.

Kirk's Lord Nelson. Rather large, roundish, striped; quality moderate. Autumn. English.

Kittageskee. Rather small, oblate, yellow; crisp, tender, sub-acid, very good. Winter. Southern.

Klaproth, p. 192.

Knickerbocker. Medium, roundish oblate, greenish yellow, brisk sub-acid, good. Autumn.

Knight's Golden Pippin. See Downton Pippin.

Kohl. Small, roundish—good keeper. German.

Krowser. Medium, roundish conic, striped; flesh white, mild sub-acid. Winter. Pa. Productive and popular.

Lacker, p. 217.

Ladies' Blush. See Gabriel.

Ladies' Favorite of Tenn. See Buckingham.

Ladies' Sweeting, p. 209.

Lady Apple, p. 227.

Lady's Fancy. Above medium, oblong conical, yellow and red; agreeable, sub-acid. Early winter. Vt.

Lady Washington. See Cooper.

Lake. Small, ovate conic, striped; sub-acid, very good. A great bearer. Ohio.

Lancaster Greening. Medium, roundish conic, greenish yellow; sub-acid—cooking. Good keeper. Pa.

Landon. Medium, roundish, yellow and red; flesh yellowish, firm, crisp, aromatic, very good. Winter. Vt.

Landrum. Medium, conic, deep crimson; rather coarse, rich. Autumn. Southern.

Lane's Red Streak. Large, roundish conic, yellow, with small stripes; sub-acid, good. October. Illinois.

Lane Sweet. Medium, oblate, yellow; sweet, aromatic. Winter. Mass.

Lansingburg. Medium, roundish conic; yellow, with a handsome red cheek; flesh firm; sub-acid, moderately rich—keeps through spring. Ohio. New.

Large Romanite. See Pennock.

Large Striped Winter Pearmain; or, Striped Sweet Pippin. Large, roundish, slightly oblate, striped on yellow; very mild, sub-acid, good. October to January. Southern.

Large Yellow Bough. See Sweet Bough.

Late Baldwin. See Baldwin.

Late Bough. See Autumn Sweet Bough.

Late Golden Sweet. See Baker's Sweet.

Late Queen. Large, roundish conical, pale red on yellow; sub-acid, good. Autumn. Ohio.

Late Strawberry, p. 203.

Lawver. Rather large, roundish, regular, whole surface handsomely striped with red; sub-acid, flavor moderate. Its productiveness and beautiful appearance promise value for market. Winter. West. New.

Ledge Sweet. Large, roundish oblate, yellowish green with a blush; sweet. A good keeper. N. H.

Leicester Sweet, p. 211.

Leland Pippin; or, Leland Spice, p. 203.

Lemon Pippin. Medium, oval, greenish yellow; sub-acid. English.

Lewis. Medium, oblate conic, skin yellow, striped; flesh yellow, compact, rich, sub-acid. Early winter. Indiana.

Liberty. Rather large, oblong conic, striped; flesh yellow; firm, mild sub-acid. Long keeper. Western.

Limber Twig, p. 218.

Lincoln Pippin. See Winthrop Greening.

Lippincott's Sweet. Rather large, greenish white. Productive, keeps till spring, good. N. J.

Little Pearmain. See Bullock's Pippin.

Locy. Roundish, variable, striped; flesh greenish, pleasant. Early winter.

London Sweet, p. 211.

Long Island Seek-no-further, or R. I. Seek-no-further, p. 203.

Long John, or Red or Long Pearmain. See Kaighn's Spitzenburgh. [Another Long John is green, has a dry flesh, and is a great keeper.]

Long Stem of Pa., p. 218.

Long Stem of Conn. is roundish, yellow. Long Stem of Mass. is oblate, with a blush. Long Stem of Ky. is oblate, striped.

Long Stem Sweet. See Baker's Sweet.

Loudon Pippin, p. 227.

Lowell, p. 206.

Lyman's Large Summer, p. 196.

Lyman's Pumpkin Sweet, p. 198.

Lyscom, p. 203.

Mackay Sweet. Medium, roundish conic, yellow, sweet, good. Winter. Mass.

Mackie's Clyde Beauty. See Clyde Beauty.

Macomber. Medium, oblate, ribbed, striped; flesh white, tender, sub-acid. Early winter. Maine.

Magnum Bonum. See Bonum.

Magnolia, p. 203.

Maiden's Blush, p. 207.

Maiden's Favorite. Rather small, oblong, whitish yellow and crimson; pleasant, very delicate. Winter. N. Y.

Major. Large, roundish, red; flesh yellowish, crisp, pleasant, rich. Pa.

Male Carle, or Charles Apple. Medium, regular, smooth yellow with a fine cheek, handsome; not rich, pleasant. Autumn. Succeeds South. Foreign.

Mamma Beam. See Belmont.

Mangum, p. 204.

Manks Codlin. Medium, roundish oblong, yellow—cooking. August. English.

Manomet Sweet, p. 189.

Mansfield Russet. Small, oblong conic, cinnamon russet; rich, aromatic. Good bearer and keeper. Mass.

Maria Bush. Large, round oblate, striped; flesh white, tender, sub-acid. Autumn. Pa.

Marks. Medium, roundish conic, light yellow; flesh whitish, fine, perfumed, very good. Winter. Pa.

Marshall. Rather large, roundish, green—market. April to July. Vigorous and productive.

Marston's Red Winter, p. 218.

Martin. See McLellan.

Masten's Seedling. Medium, round ovate, greenish yellow; mild, pleasant sub-acid, agreeable. Dutchess Co., N. Y. Winter. New.

Mattamuskeet. Medium, yellow and red; brisk sub-acid. Winter. Good keeper. N. C.

Maverack's Sweet, p. 209.

Maxey. Full medium, striped; sub-acid, good, rather dry. Long keeper. Ky.

Maxfield. See Mangum.

May, or May Apple. A southern name of White Juneating, or nearly resembling it. [Another May Apple at the South is medium, roundish conical, striped — both ripen there early in summer. Another May Apple at the West is a light red, coarse, long-keeping variety, of little value.]

McAfee's Nonsuch. Large, roundish oblate, striped; pleasant, sub-acid. Early winter. Ky.

McCoy's Pippin. Large, oblate, greenish white; pleasant sub-acid, good. Autumn. Pa.

McDowell's Sweet. Medium, roundish oblate, striped; sweet, very good. Autumn. N. C.

McHenry. Resembles American Summer Pearmain—keeps till winter. Growth free.

McKinley. Large, dull red, showy; good, sub-acid. Early winter. Mo.

McLellan, p. 218.

Meach. Large, roundish, striped, light red; rich, mild sub-acid, aromatic. Autumn. Vt.

Meigs. See Red Winter Pearmain.

Melon, p. 204.

Melt-in-the-mouth, p 204.

Melvin Sweet. Medium, roundish, striped pale red; rich. December. Mass.

Menagere. Very large, flat, pale yellow—cooking. German.

Merritt's Sweet. Medium, oblate, yellow; very sweet—good bearer. August and September.

Methodist. Medium, oblong oval, greenish, striped; mild sub-acid, not rich. November. Conn.

Mexico, p. 204.

Michael Henry Pippin, p. 227.

Mifflin King. Small, oblong oval, dull red; very good. Autumn. Pa.

Milam, p. 218.

Millcreek. See Smokehouse.

Millcreek Vandevere. See Smokehouse.

Miller Apple. Large, ovate, striped; mild sub-acid, rich. Autumn. N. Y. [Another Miller Apple, in Pa., is rather small, striped, with white flesh. October.]

Miller's Best Sort. See Progress.
Minister, p. 218.
Minkler. Medium, conic, red; acid, good, long keeper. Ill. New.
Molasses. There are several of this name, all medium in size, striped, and sweet.
Monarch. Medium, roundish oblate, striped; sub-acid. Autumn.
Monk's Favorite, p. 219.
Monmouth Pippin, p. 227.
Monstrous Pippin, p. 228.
Montreal. See St. Lawrence.
Moore's Extra. Above medium, striped, fine grained, mild sub-acid, very good. Winter. Ohio.
Moore's Greening. Medium, round, greenish yellow; brisk acid, good. Productive. Winter. Conn.
Moore's Sweeting. Medium, oblate, deep red; sweet, dry—good keeper.
Moose, or Mouse. Large, roundish oblong, greenish; flesh yellow, fine grained, light, delicate. N. Y.
Morrison's Red. Medium, conic, light yellow and red; mild, pleasant. Winter. Mass.
Moses Wood. Medium, roundish, yellow and red; tender, juicy, pleasant, sub-acid. September. Vigorous, productive.
Mote's Sweet. Large, roundish, light yellow; rich sweet, very good. Autumn. Ohio.
Mother, p. 218.
Mountain Pippin. See Fallawater.
Munson Sweeting, p. 198.
Murphy, or Murphy's Red. Large, roundish oblong, striped; tender, agreeable. Early winter. Mass.
Murray. Medium, oblong conic, rich orange yellow; brisk, sub-acid. Winter. Southern.
Muskmelon. See Toccoa.
Musk Spice. See Fall Wine.
Myers' Nonpareil, p. 204.
Mygatt's Bergamot. See Dyer.

Naigle's Winter. Medium, yellow and red, crisp, juicy, sub-acid, very good. Productive. Early winter. Missouri.
Nantahalee. Medium, oblate, conic, pale green, sprightly and good. Summer. Alabama.
Ned. Medium, striped; pleasant sub-acid, very good. Early winter. Pa.
Ne Plus Ultra of Ga. See Buckingham.
Nequassa. Large, oblate, striped; flesh white, very sweet. December. N. C.
Neverfail. See Rawle's Janet.
Neversink. Large, roundish, red on yellow; very good—pineapple flavor. Winter. Pa.
Newark King, p. 219.
Newark Pippin, p. 228.
Newark Sweeting. See Campfield.
New Jersey Red Streak. See Early Pennock.
Newtown Greening. See Golden Pippin of Westchester Co.
Newtown Pippin, p. 228.
Newtown Spitzenburgh, p. 219.
New York Greening. See Golden Pippin of Westchester Co.
New York Spice. See Leland Spice.
New York Vandevere, p. 219.
Nickajack, p. 219.
Nix Green. Medium, oblate, greenish yellow; sub-acid, good. Early winter. Ga.
Nodhead. See Jewett's Fine Red.

Nonpareil, or Old Nonpareil. Rather small, roundish ovate, greenish yellow; rich, acid. December. English—of little value here.

Nonsuch. Medium, oblate, regular, striped light red; soft, sub-acid. English.

Norfolk Beaufin. Large, oblate, dull red; flesh firm, poor—cooking. Good keeper. English.

Northern Golden Sweet. See Northern Sweet.

Northern Spy, p. 219.

Northern Sweet. Medium, roundish conic, yellow; sweet, rich, very good. Autumn. Vermont.

Norton's Melon. See Melon.

Oconee Greening. Very large, roundish oblate, yellow; lively sub-acid, aromatic, very good. Resembles Disharoon. Winter. Ga.

Oglesby. Medium, oblate, yellow; crisp, sub-acid, good. Va.

Ohio Favorite. See Ortley.

Ohio Nonpareil. See Myers' Nonpareil.

Ohio Pippin. See Ernst's Pippin.

Ohio Red Streak. Medium, oblate, striped; compact, rich, sub-acid. Winter. Ohio.

Ohio Wine. See Fall Wine.

Old English Codlin. Rather large, oblong conic, yellow; sub-acid—cooking. Summer and autumn. English.

Oldfield. Medium, oblate conic, yellow; mild sub-acid, pleasant. Winter. Conn.

Old Nonsuch. See Red Canada.

Old Town Crab, or Spice Apple of Va. Rather small, greenish yellow; crisp, sweet, pleasant, aromatic. Winter.

Old Town Pippin. See Hubbardston Nonsuch.

Orange. See Lowell. Several others are called Orange.

Orange Sweet. Several of this name.

Orndorf, p. 204.

Orne's Early. Rather large, pale yellow. September. Foreign.

Ortley, p. 229.

Osborn's Sweet. Large, roundish, yellow; sweet. October. Western.

Osceola, p. 219.

Osgood's Favorite. See Lyscon.

Oslin. Rather small, oblate, yellow; firm, rich, aromatic. August. Scotch.

Overman's Sweet. Medium, conic, striped; sweet, very good—baking. October. Ill.

Ox Apple. See Monstrous Pippin.

Ox Eye. See N. Y. Vandevere.

Park Spice, or Park Apple. Medium, roundish, striped; mild sub-acid, aromatic, very good. Winter. Productive. Westchester Co., N. Y.

Paradise, Summer Sweet, p. 198.

Paradise, Winter Sweet, p. 212.

Patterson Sweet. See Bailey's Sweet.

Pawpaw. Medium, striped; mild, sub-acid. Mich.

Peach Pond Sweet. Medium, oblate, striped light red; tender, sweet, agreeable. Autumn. N. Y.

Pearsall's Sweet. Large, light red, shaded and striped; coarse, sweet, good. Early winter. Productive, good for baking. Long Island.

Peck's Pleasant, p. 229.

Pennock's Red Winter. Large, roundish, slightly oblong, deep dull red; rather coarse, mild, pleasant. Affected with bitter rot. Good keeper. Pa.

Pennsylvania Vandevere. See Vandevere.

People's Choice. Medium, oblate, bright red; brisk sub-acid. Winter. Pa.

Perry Russet. Medium, roundish conical, lightly russeted on pale yellow; firm, brisk sub-acid, good. Early winter.

Petersburgh Pippin. See Newtown Pippin.

Philadelphia Sweet. See Autumn Sweet Bough.

Philippi. Large, oblate conical, greenish yellow; tender, fragrant, very good. January. Pa.

Phillips' Sweeting, p. 210.

Pickman Pippin. Medium, roundish oblate, yellow; acid—cooking. Winter. Mass.

Pine Apple Russet. Medium, conic, whitish yellow; sub-acid—of little value. Autumn.

Pink Sweeting. Small, greenish and bright red; rich, pleasant, sweet. Great bearer. September, October. Pa.

Pittsburgh Pippin, p. 229.

Pittstown. Rather large, roundish, slightly oblong, light yellow, with a brown blush; tender, mild, sub-acid, good. October. Pittstown, N. Y.

Polhemus of Long Island. See Moore's Sweet.

Polly Bright. Oblong conic, light yellow, with a red cheek; tender, pleasant. September, October. Va. and West.

Pomme de Neige. See Fameuse.

Pomme Grise, p. 229.

Pomme Royal. See Dyer.

Porter, p. 207.

Potter's Sweet. See Leicester Sweet.

Poughkeepsie Russet. See English Russet

Pound Royal, p. 229.

Pound Sweet. See Lyman's Pumpkin Sweet. Several others of the name.

Pownal Spitzenburgh. Rather large, oblate, slightly conic, striped; sub-acid. Winter.

Pres. Ewing. Medium, roundish, striped; firm, agreeable, sub-acid. Winter. Ky.

Pride of September. See September.

Priestley. Medium, roundish oblong, striped dull red; spicy, good. Winter. Pa.

Priest's Sweet. Medium, roundish conic, striped dull red; tender, pleasant. Good keeper. Mass.

Primate, p. 196.

Princely. Rather large, roundish oblate, striped; sub-acid, fine. Autumn. N. J. and Pa.

Prince's Harvest. See Early Harvest.

Progress, p. 229.

Prolific Sweet. Roundish conic, green; pleasant, sweet, spicy. Great bearer. December. Conn.

Pryor's Red, p. 219.

Pumpkin Russet, p. 198.

Pumpkin Sweet. See Lyman's Pumpkin Sweet. There are several varieties under the name Pumpkin Sweet.

Putman Harvey. Medium, roundish oblate, pale green; tender, sub-acid, agreeable. August and September.

Putnam Russet. See Roxbury Russet.

Quince. Rather large, roundish oblate, yellow; mild, sub-acid, aromatic. November.

Ragan, p. 220.
Rambo, p. 204.
Rambour d'Eté, or Summer Rambour. Medium, flat, striped; sub-acid. September. French.
Ramsdell's Sweeting, p. 210.
Randel's Best. Medium, roundish, striped; sweet. December.
Rawle's Janet, p. 220.
Ray Apple. See Munson's Sweet.
Rebecca. Large, roundish oblate, whitish yellow and crimson; tender, pleasant, spicy. August, September. Del.
Red and Green Sweet. Large oblong conic, ribbed, striped; quality moderate—baking. End of summer.
Red Astrachan, p. 196.
Red Bellflower. Large, oblong conic, striped; mild, sub-acid, becoming mealy. Worthless. French.
Red Calville, or Red Winter Calville. Medium, roundish conic, ribbed, red; mild, sub-acid. Winter. Foreign.
Red Canada, p. 220.
Red Cat-head. Large, roundish conic, yellow, shaded red; brisk, pleasant. Autumn. Va.
Red Cheek. See Fall Orange. Several others of the name.
Red Cheek Pippin. See Monmouth Pippin.
Red Detroit, p. 215.
Red Doctor. See Doctor.
Red Gilliflower. See Cornish Gilliflower.
Red Hazel. See Berry.
Red Ingestrie. Small, ovate, yellow and red; firm, rich. Autumn. English. Of little value here.
Red June. See Carolina Red June.
Red Pearmain. See Kaighn's Spitzenburgh.
Red Pumpkin Sweet. See Ramsdell's Sweet.
Red Quarrenden. See Devonshire Quarrenden
Red Republican. Large, roundish oblate, striped; coarse; sub-acid. Autumn. Pa.
Red Russet, p. 229.
Red Seek-no-further. See Keiser.
Red Spitzenburgh. See Kaighn's ditto.
Red Streak. Medium, roundish, streaked; rich, firm, dry — for cider. English.
Red Stripe. Rather large, oblong, conical, striped; mild, sub-acid, very good. Late summer. Ind.
Red Sweet. Medium, roundish oval, striped; tender, sweet, very good. December. Ohio.
Red Vandevere. See Vandevere.
Red Winter Pearmain, p. 221.
Red Winter Sweet. Medium, roundish, striped deep red; coarse, rich, very sweet. Early winter. Va. and Ky.
Republican Pippin, p. 204.
Rhode Island Greening, p. 229.
Rhode Island Seek-no-further, p. 203.
Ribston Pippin, p. 205.
Richards' Graft, p. 205.
Richfield Nonsuch. See Red Canada.
Richmond, p. 198.
Ridge Pippin. Large, roundish conic, yellow; mild, aromatic. Spring.

Riest. Large, roundish, yellow; pleasant, very good. August. Pa.

Ritter. Medium, roundish oblong, striped, good. Autumn. Pa.

River. Rather large, oblong ovate, striped; coarse, pleasant, sub-acid. Autumn. Mass.

Roadstown Pippin. Large, oblate, greenish yellow; sprightly sub-acid—market and cooking. N. J.

Roberson's White, p. 208.

Robey's Seedling, p. 221.

Rockingham Red. See Allum.

Rock Apple. Large, roundish, striped; sub-acid, very good. Autumn. N. H.

Rock Sweet. Rather small, roundish, oblate conic, striped; sweet, rich. September. Mass.

Rockport Sweet. Medium, oblate, yellow, with a red cheek; sweet, aromatic. Winter. Mass.

Romanite. See Carthouse.

Roman Stem, p. 230.

Rome Beauty, p. 221.

Roseau. Large, irregular, dark red; of little value. Foreign.

Rose Red. Medium, oblate, striped and shaded red, lively sub-acid, very good. Autumn. Western N. Y.

Ross Nonpareil. Small, roundish, thin russet; rich sub-acid, aromatic. October. Irish. Of little value.

Rosy Red. Medium, striped; mild sub-acid. Early winter. Michigan.

Roxbury Russet, p. 230.

Royal Pearmain. See Herefordshire Pearmain.

Royal Pippin. See Carter.

Rum Apple. Medium, oblate, yellow, shaded crimson; sub-acid. Winter. N. H.

Runnels. Medium, green, rough; flesh firm, very good. Late keeper—market.

Russet Pearmain, p. 222.

Rymer. Large, oblate conic, yellow, shaded crimson; sub-acid. December. Foreign.

Sailly Autumn. Medium, oblate conic, greenish yellow, with a reddish cheek; tender, rich, aromatic. September. N. Y.

Sapson. Small, roundish ovate, dark red—resembles Sops of Wine, but is smaller, firmer in flesh, and less valuable.

Sassafras Sweet. See Haskell's ditto.

Saxton, or Fall Stripe. Bright red, sub-acid, crisp, pleasant. September.

Scarlet Nonpareil. Medium, roundish conic, striped; sub-acid. November. English.

Scarlet Pearmain. Medium, ovate conic, crimson; flesh white, good. Autumn. English.

Scarlet Perfume. See Cole.

Schoonmaker. Large, roundish oblate, greenish yellow; brisk sub-acid, good. Winter.

Scollop Gilliflower. Rather large, roundish conic, much ribbed, striped; firm. December. Ohio.

Seager. Large, roundish conic, red striped; good.

Seago. See Mangum.

Seek-no-further. See Green do., and Westfield do.

Seever's Red Streak. Medium, roundish, striped; sub-acid. Autumn. Ohio.

Selma. Rather large, roundish oblate, yellow, russet, and dull red;

mild sub-acid, good. December. Ohio.

September. Large, roundish; yellow; agreeable, sub-acid. October. Pa.

Shakers' Yellow. See Early Pennock.

Sharpe's Early. See Summer Queen.

Sharp's Spice. See Fall Wine.

Sheep Nose. See Bullock's Pippin. Other sorts of the name.

Sheppard's Sweet. Medium, ovate, ribbed, striped; sweet, pleasant. Autumn. Conn.

Sherwood's Favorite. See Chenango Strawberry.

Shiawasse Beauty, p. 205.

Shippen's Russet. Large, roundish oblate; spongy, acid. Winter.

Shirley. See Foundling.

Shockley, p. 222.

Siberian Crab, p. 208.

Sinclair's Yellow. See Early Harvest.

Sine Qua Non, p. 196.

Slingerland Pippin. Rather large, conic oblate, yellow, shaded red; rich sub-acid. Early winter. N. Y.

Smalley, or Spice. Medium, oblate conic, yellow; brisk, aromatic. Autumn. Conn.

Smith's Cider, p. 222.

Smithfield Spice. See Dyer.

Smokehouse, p. 203.

Snow. See Fameuse.

Sol Carter. See Equinetely.

Somerset. Large, roundish, yellow and red; tender, juicy, sub-acid. September.

Sops of Wine, p. 193.

Sour Bough. See Summer Pippin.

Spencer Sweeting. See Hartford Sweeting.

Spice Apple of Virginia. See Old Town Crab.

Spice Russet. Small, round oblate, yellow russet; aromatic, good. Winter.

Spice Sweeting, or Berry Bough. Medium, oblate, smooth, pale yellow; sweet, aromatic; often knotty. August.

Sponge. Large, roundish, striped red on light green; rather acid. December.

Sprague. Rather small, oblong ovate, yellow; sub-acid. October.

Springport Pippin. Medium, roundish, yellowish green; sub-acid, very good. Winter. Cayuga Co., N. Y.

St. Lawrence, p. 205.

Stanard. Large, roundish, yellow and red; rather coarse, sub-acid. December. Erie Co., N. Y.

Stansill. Rather large, oblate, striped; sub-acid. January. Early bearer. N. C.

Stark. Large, striped, coarse, mild sub-acid, good. Valuable as a keeper. Ohio.

Starr. Large, oblate, greenish yellow, sub-acid, good. Summer cooking. N. J.

Steele's Red Winter. See Baldwin—also Red Canada..

Steel's Sweet. Medium, round, ribbed; yellow. Winter. Conn.

Stehly. See Hiester.

Sterling Beauty. See American Beauty.

Stillman's Early. Small, roundish conic, yellow; tender, pleasant, sub-acid. July and August. Oneida Co., N. Y.

Stillwater Sweet. Medium, greenish yellow, tender, sweet, very good. Autumn. Ohio.

Straat. See Stroat.

Strawberry. See Late Strawberry and Chenango Strawberry.

Striped Ashmore. See Ashmore.

Striped Belle Fleur. See Red Bellflower.

Striped Harvest. See Harvest Red Streak.

Striped Pearmain, or Striped Winter Pearmain. See McAfee's Nonsuch.

Stroat. Medium, roundish ovate, yellowish green; rich, very good. Autumn. N. Y.

Sturmer Pippin. Small, oblate, yellow and red; rich, sub-acid. Winter. Ky.

Sudlow's Fall Pippin. See Franklin Golden Pippin.

Sugar Loaf Pippin. Medium, oblong conic, smooth, whitish yellow; sub-acid, poor. Summer. English.

Sugar Sweet. Large, conic, ribbed, yellow, shaded red; rich, very sweet. Winter. Mass.

Summer Bellflower. Medium, ovate, yellow; flesh white, rich, sub-acid, very good. August. Dutchess Co., N. Y.

Summer Golden Pippin. Small, ovate, yellow; rich. August. English.

Summer Hagloe, p. 193.

Summer Horse. See Horse.

Summer Pearmain. See Autumn Pearmain.

Summer Pippin, p. 197.

Summer Pound Royal. Large, roundish conic, greenish white, fine grained, tender, sub-acid, very good. End of summer. Profitable. Grown in Ohio and Michigan.

Summer Queen, p. 193.

Summer Rambo. A corruption of Summer Rambour.

Summer Rambour. See Rambour d'Ete.

Summer Rose, p. 103.

Summer Sweet of Ohio. See High Top Sweeting. [A Summer Sweet of Conn., has medium, yellowish fruit, with sweet and tender flesh, and is valuable for baking, ripening in September.]

Summer Sweet Paradise, p. 198.

Summerour. See Nickajack.

Superb Sweet. Large, roundish, yellow and red; tender, rich, sweet. Autumn. Mass.

Surprise. Small, roundish, yellow; flesh red. Of little value.

Sutton Beauty. Rather large, roundish, yellow and crimson; sprightly sub-acid. December. Mass.

Swaar, p. 230.

Sweet and Sour. Rather large, with green acid ribs, and yellow insipid hollows between them—a curiosity only.

Sweet Baldwin. Medium roundish, deep red; firm, sweet—of little value. November.

Sweet Bough, p. 290.

Sweet Fall Pippin. Large, oblate, greenish yellow; sweet, rich. October, November. N. Y.

Sweet Golden Pippin. See Autumnal Swaar.

Sweet Golden Russet. Rather large, conical, yellow, russeted; rich, sweet. September, October. Hardy, productive.

Sweet Harvest. See Sweet Bough.

Sweet Harvey. See Sweet Vandevere.

Sweet June of Illinois. See High Top Sweeting.
Sweet Nonsuch. See Sweet Romanite.
Sweet Pearmain. See Kenrick Sweet.
Sweet Pippin. See Hog Island Sweet; also Moore's Sweet.
Sweet Rambo. Medium, roundish oblate, yellow, shaded red with large dots; tender, juicy, rich, aromatic. Late autumn. Pa.
Sweet Red Streak. See Sweet Vandevere.
Sweet Romanite, p. 210.
Sweet Russet. See Pumpkin Sweet.
Sweet Swaar. See Autumnal Swaar.
Sweet Vandevere, p. 210.
Sweet Wine. See Fall Wine.
Sweet Wine Sap. Medium, oblate, splashed deep crimson; tender, juicy, sweet, rich. November. Pa.
Swiss, or Switzer Apple. See Pittsburgh Pippin.

Tallman Sweeting, p. 212.
Tallow Apple. See Lowell.
Tart Bough. See Early Harvest. This name is also applied to two other sorts, one of which resembles Early Harvest, but is later, more acid, and the tree of more rapid growth; the other is a small, whitish, roundish, conical apple, with a pleasant sub-acid flavor; ripening in August.
Taunton. Large, oblate conic, greenish-yellow and striped; aromatic, acid, good. Autumn. Southern.
Tenderskin. Small, yellow, and striped; tender, pleasant, sub-acid, very good. Early winter. Southern.
Terral's Late. Large, striped; sub-acid, good. Autumn. Great bearer. Southern.
Tetofsky. Medium, roundish or oblate conic, striped; flesh white, sprightly, agreeable. August. Succeeds at the North and West. Russian.
Tewksbury Blush, p. 230.
Tibbett's Seedling. Large, conic, whitish; sub-acid, pleasant. Mich.
Tift Sweeting, p. 198.
Tinmouth, or Teignmouth. Rather large, oblate, whitish yellow, shaded red; mild sub-acid. Early winter. Very hardy. Vt.
Titus Pippin. Large, oblong conic, light yellow; not high flavored. December.
Toccoa. Rather large, conic, irregular striped; with a rich Spitzenburgh flavor. August. Ga.
Tompkins. See Dyer.
Tompkins Co. King. See King.
Toole's Indian Rareripe. Large, roundish, light yellow, reddish cheek; sub-acid, good—culinary. Early autumn.
Townsend. See Hocking.
Trenton Early, p. 197.
Trumbull Sweeting. Rather large, round oblate, yellow; sweet, good. Autumn. O.
Tulpahocken. See Fallawater.
Turkey Greening. Large, oblate, green with a dull blush; flesh greenish; sub-acid, not rich. Winter. Conn.
Turner's Green. See Winter Cheese.
Tuttle, of Conn. Large, roundish, regular, striped dark red; pleasant sub-acid, good.
Twenty Ounce, p. 205.

Twitchell's Sweet. Medium, conic, red and purple; flesh white, stained; sweet, pleasant flavor. November. N. H.

Uncle Sam's Best. See Fall Wine.

Vandevere. (White Vandevere, Green do.; Little Vandevere of Ind.; Vandevere of Pa.) Medium, oblate, striped; compact; rich, sub-acid flavor. October to January. Del. Superseded. Distinct from N. Y. Vandevere, and Vandevere Pippin.

Vandevere Pippin, p. 205.

Vandyne. Large, roundish, yellow; sub-acid, agreeable. October.

Vaughan's Winter. Medium, oblate oblique, whitish yellow, shaded red; agreeable. Winter. Ky.

Vermont. See Walworth.

Vermont Pippin. See Tinmouth.

Victorious Reinette. Large, roundish, oblong, pale yellow; pleasant, aromatic. Winter. German.

Victuals and Drink. Large, oblong, dull yellow; rich, sweet, very good. Early winter and later. N. J.

Virginia Greening, p. 230.

Wabash Bellflower. Large, ovate, orange red on yellow; sub-acid, good—handsome. November. Pa.

Waddel Hall. See Shockley.

Wagener, p. 223.

Walker's Yellow. Large, conic, golden yellow; rather acid. Winter. Pa.

Walpole. Medium, roundish, striped; sub-acid. Late summer. Mass.

Walworth. See Summer Pippin.

Warfield, p. 197.

Warren Pennock. See Early Pennock.

Warren Pippin. See Ortley.

Washington. See Sops of Wine.

Washington Royal. Rather large, round oblate, yellowish green; fine flavored—keeps till July. Mass.

Washington Strawberry, p. 206.

Water. Medium, ovate, whitish yellow with crimson cheek; pleasant sub-acid, very good. Autumn and winter. Handsome and valuable. Pa.

Watson's Dumpling. Large, roundish, red on yellowish green; sub-acid—cooking. Late autumn. English.

Watson's Favorite. Medium, roundish oblate, red on yellow; pleasant, rich, juicy, very good.

Waxen of Coxe. Medium, roundish oblate, pale yellow; mild sub-acid. November. Va.

Wealthy. Medium, roundish oblate, striped; flesh white, fine grained; tender, lively, sub-acid, very good. Tree very hardy. Minn.

Wellford's Yellow, p. 223.

Wellington Apple. See Dumelow's Seedling.

Wells' Apple. See Domine.

Wells' Sweeting, p. 212.

Westchester Seek-no-further. See Long Island ditto.

Western Spy, p. 231.

Westfield Seek-no-further, p. 223.

Weston. Medium, roundish conical, striped on light yellow; mild, pleasant. October. Mass.

Wetherell's White Sweeting. Large, yellow. September. N. J.

Wheeler's Sweet. Large, conical, ribbed, yellow, with a red cheek; sweet, pleasant. October. Ohio.
White Astrachan. Medium, roundish, very smooth; tender, delicate, rather dry. August. Russian. Of little value.
White Bellflower. See Ortley.
White Detroit. See Ortley.
White Doctor. Large, roundish oblate, greenish yellow; acid, not rich. Autumn. Pa.
White Golden Sweet. See Baker's Sweet.
White Hawthornden. See Hawthornden.
White Juneating, p. 197.
White Pippin, p. 231.
White Rambo, p. 231.
White Seek-no-further. See Green ditto.
White Spanish Reinette, p. 231.
White Spice. See Dyer.
White Sweeting. Medium, roundish oblate, white with a red cheek; very sweet—culinary. Autumn. Great bearer. Maine.
White Vandevere. See Vandevere.
Whitewater Sweet. Medium, round, yellow; sweet—long keeper. Southern Ohio.
White Winter. Small, round, light yellow, with a red cheek; juicy, mild, sub-acid, not rich. Spring. Pa.
White Winter Calville. Medium, roundish conic, ribbed, yellow; coarse, pleasant. December. French. Valueless here.
White Winter Pearmain, p. 232.
Whitney's Russet. Medium, oblate, russeted; flesh fine grained; rich, spicy. Winter. Canada.
Williams' Early Red. See Williams' Favorite.
Williams' Favorite, p. 194.
William Penn. Rather large, round oblate, grayish stripes on greenish yellow; juicy, rich, aromatic, very good. February. Pa.
William Tell. See Pittsburgh Pippin.
Willis Sweet. Rather large, roundish, light yellow with some red; sweet, rich, very good—productive. Early autumn. L. I.
Willow Twig, p. 224.
Wine, p. 224.
Wine of Conn. See Twenty Ounce.
Wine Sap, p. 224.
Wine Strawberry. See Richards' Graft.
Wine Sweeting, p. 211.
Winn's Russet. Large dark russet, striped; sub-acid. Good keeper. Maine.
Winslow. Large, round, striped; sub-acid. November and December. Va.
Winter Cheese, p. 332.
Winter Genneting. See Rawle's Janet.
Winter Harvey. Large, roundish conic, pale yellow.
Winter King. See King of Tompkins Co.
Winter Pearmain. See Autumn Pearmain. Some other sorts of the name.
Winter Pippin of Geneva, p. 232.
Winter Pippin of Vermont. Large, round, yellow with red cheek; tender, agreeable. Winter.
Winter Queen. Medium, conic, crimson; mild sub-acid. Early winter.
Winter Queen. See Fall Queen of Kentucky.

Winter Seek-no-further. See Fall ditto.
Winter Sweet Paradise, p. 212.
Winter Wine. See Wine.
Winthrop Greening, p. 209.
Winthrop Pearmain. Large, round ovate, striped; spicy, pleasant. Autumn. Me.
Wolf's Den. See Averill.
Wolman's Harvest. See Summer Rose.
Wood's Greening, p. 232.
Wood's Sweet. Large, oblate, irregular, striped; tender, juicy, rich; very good. Autumn. Vt.
Woodstock. See Dyer.
Woodstock Pippin. See Blenheim Pippin.
Woolman's Long. See Ortley.
Wormsley Pippin. Medium, roundish, greenish yellow; sharp subacid. September. English.
Wright Apple. Medium, roundish oblate, yellow; tender, juicy, aromatic, almost sweet. Autumn. Vt.
Wyker Pippin. See Golden Reinette.

Yacht. Large, roundish, striped; sub-acid. Winter. Pa.
Yellow Bellflower, p. 232.
Yellow German Reinette. See Golden Reinette.
Yellow Harvest. See Early Harvest.
Yellow Horse. See Horse.
Yellow Ingestrie. Small, yellow; spicy—valueless. Foreign.
Yellow Juneating. See Early Harvest.
Yellow Meadow. Large, oblate, greenish yellow; compact, rich, very good. November. Southern.
Yellow Newtown Pippin, p. 232.
Yellow Pearmain. See Golden Pearmain.
Yopp's Favorite. Large, roundish, greenish yellow; juicy, sub-acid, very pleasant. Ga.
York Imperial; or, Johnson's Fine Winter. Medium, roundish oval, ribbed, red; aromatic, very good. Pa.
York Pippin. See Fall Pippin.
York Russet. See Pumpkin Russet.
Yorkshire Greening. Large, round ovate, dull green, striped; acid. Winter. English.
Young's Long Keeper. See Easter Pippin.
Yost. Flat, striped; coarse, pleasant, sub-acid. December. Pa.

Zane; or, Zane Greening. Large, roundish, green; poor. Winter.
Zieber. Small, yellow, striped; dry, good.

APRICOTS.

Abricot Blanc. See White Masculine.
Abricot Common. See Roman.
Abricotier. See Red Masculine.
Abricot Pêche. See Peach.
Alberge. See Albergier.
Albergier, p. 332.
Anson's. See Moorpark.
Anson's Imperial. See Peach.

Black, p. 332.
Blanc. See White Masculine.

Blenheim. See Shipley's.
Breda, p. 332.
Briancon. A small tree or shrub, a native of the Alps. Fruit small, round, scarcely eatable. Ornamental.
Brown Masculine. See Red Masculine.
Brussels, p. 332.
Burlington, p. 332.

D'Alexandrie. See Musch.
D'Hollande. See Breda.
Double Flowering. Ornamental—rare here.
Dubois Early Golden. See Early Golden.
Du Luxembourg. See Peach.
Dunmore. See Breda.

Early Golden, p. 332.
Early Masculine. See Red Masculine.
Early Orange. See Orange.
Early White Masculine. See White ditto.

Germine. See Roman.

Hemskirke, p. 332.

Lafayette, p. 333.
Large Early, p. 333.
Large Turkey. See Turkey.

Moorpark, p. 333.
Musch, p. 333.

Noir. See Black.

Oldaker's Moorpark. See Moorpark.
Orange, p. 333.

Pêche. See Peach.
Pêche Grosse. See Peach.
Peach, p. 334.
Persian. See Orange.
Purple Apricot. See Black.

Red Masculine, p. 334.
Ringgold, p. 334.
Roman, p. 334.
Royal, p. 334.
Royal Orange. See Orange.
Royal Peach. See Peach.
Royal Persian. See Orange.

Shipley's, p. 334.
Shipley's Large. See Shipley.

Temple's. See Moorpark.
Texas, p. 334.
Transparent. See Roman.
Turkey, p. 334.

Violet. See Black.

Walton Moorpark. See Moorpark.
White Apricot. See White Masculine.
White Masculine, p. 335.
Wurtemburg. See Peach.

BLACKBERRIES.

Adair's Claret. Medium, pale red; soft, pleasant. Not quite hardy. Ky.
Albion. Large, light red, imperfect, poor, not productive.
Cape May. Large, black; sweet, soft; loses color.
Crystal White. Medium, oblong oval, light creamy white, sweet. Only a curiosity. Not hardy. Ill.

Cumberland. Medium, black; sweet, early. Hardy. N. J.

Cut-leaved. Small, roundish, black; an old European sort.

Cutter's Mulberry. Long, slender; sweet. Mass.

Dewberry, or Low Blackberry. A wild bush, producing sweet, excellent fruit.

Dorchester, p. 446.

Farley. Large; sweet, early. New.

Felton. Large, oblong; sweet, good, often defective. Early. N. J.

Holcomb. Large, roundish oval, black; sweet, very good. Vigorous and productive. Conn.

Kittatinny, p. 446.

Missouri Mammoth, p. 446.

Newman's Thornless, p. 447.

New Rochelle, p. 447.

Sable Queen. Medium or large, black. Mass.

Wilson's Early, p. 447.

CHERRIES.

Adam's Crown. Medium, roundish, pale red; flavor pleasant. Late June.

Amber Gean. Small, oval heart-shaped, pale yellow; sweet, pleasant. Great bearer. Late.

American Amber. Medium, roundish heart-shaped, light amber and red; flavor moderate.

American Heart, p. 367.

Anne. Rather small, roundish, red; sweet, very good. Ky.

Ansell's Fine Black. See Black Heart.

Apple Cherry. See Gridley.

Arch Duke, p. 373.

Arden's Early White Heart. See Early White Heart.

Baumann's May. See May Bigarreau.

Belle de Bavay. See Reine Hortense.

Belle de Choisy, p. 374.

Belle d'Orleans, p. 367.

Belle de Sceaux, p. 374.

Belle Magnifique, p. 374.

Belle Vezzouris. Rather large, light red; sub-acid. Late.

Bigarreau. See Yellow Spanish.

Bigarreau, Black. Medium, heart-shaped, black; flesh firm, rather dry. Season medium.

Bigarreau Blanc. See White Bigarreau.

Bigarreau, China, p. 367.

Bigarreau Couleur de Chair. See Elton.

Bigarreau Gaubalais. See Mezel.

Bigarreau de Mai. See May Bigarreau.

Bigarreau Gros Coeuret. Large, roundish heart-shaped, suture raised, becoming reddish black; flesh firm, flavor moderate.

Bigarreau Gros Noir. See Elkhorn.

Bigarreau, Large Red. Large, oblong heart-shaped, dark red; flesh firm. Season medium.

Bigarreau, Royal and Bigarreau Tardif. See Yellow Spanish.
Black Bigarreau of Savoy. Large, heart-shaped, black; flesh purple, firm. Late.
Black Caroon, or Carone. Rather small, intermediate in character between the Mazzard and Black Heart—of little value.
Black Circassian. See Black Tartarian.
Black Eagle, p. 364.
Black Hawk, p. 364.
Black Heart, p. 364.
Black Honey. See Black Mazzard.
Black Mazzard. The wild or original type of the Heart varieties of the cherry. Small, oval, heart-shaped, black; bitter. Only valuable for raising stocks.
Black Russian. See Black Tartarian.
Black Tartarian, p. 365.
Bleeding Heart. Medium, long heart-shaped, dark red; flavor moderate. Late June.
Bloodgood's Amber: or, Bloodgood's Honey. See American Amber.
Bowyer's Early Heart. Medium, obtuse heart-shaped, amber and red; flavor pleasant. Middle of June.
Brandywine, p. 365.
Brant, p. 365.
Brenneman's Early. See Cumberland Seedling.
Bristol Cherry. See Black Mazzard.
Burr's Seedling, p. 367.
Buttner's Black Heart. Large, nearly black; flesh firm, flavor moderate. German.
Buttner's October Morello. Small, acid. Late; of little value.
Buttner's Yellow. Medium, roundish, clear yellow; flesh firm, sweet, of moderate quality. Late.
Carmine Stripe, p. 367.
Carnation, p. 374.
Caroline, p. 367.
Cerise Indulle. See Early May.
Champagne, p. 367.
China Bigarreau, p. 367.
Cleveland, p. 367.
Cluster. Quite small, round, red. Two to six in a close cluster on a common stalk; of little value.
Coe's Late Carnation, p. 374.
Coe's Transparent, p. 368.
Common English. See Black Mazzard, and Black Carone.
Common Red. See Pie Cherry.
Conestoga, p. 365.
Cumberland Seedling, p. 365.

Davenport's Early. See Black Heart.
Delicate, p. 368.
Doctor, p. 368.
Donna Maria, p. 373.
Downer, p. 369.
Downer's Late Red. See Downer.
Downing's Reed Cheek, p. 369.
Downton, p. 369.
Duchesse de Paluau, p. 374.
Dutch Morello. See Morello.

Early Black. See Black Heart.
Early May, p. 374.
Early Prolific, p. 369.
Early Purple Guigne, p. 365.
Early Richmond, p. 375.
Early White Heart, p. 369.
Elizabeth. Rather large, heart-shaped, rich dark red; flesh half tender, pleasant. Late June. Ohio.
Elkhorn, p. 365.
Elliott's Favorite, p. 369.
Elton, p. 369.
English Morello. See Morello.

Favorite. Rather small, pale yellow and red; sweet, delicate. Late June. Ohio.

Flemish. Rather large, oblate, red; sub-acid, not rich.

Flesh-colored Bigarreau. See Elton.

Florence, p. 369.

Four-to-the-Pound. See Tobacco-Leaved.

Fraser's Black Heart. See Black Tartarian.

Fraser's Black Tartarian. See Black Tartarian.

Fraser's White Tartarian. See White Tartarian.

Gascoigne's Heart. See Bleeding Heart.

German Mayduke. See Early Purple Guigne.

Gifford's Seedling. Small, round heart-shaped, light red; sweet.

Governor Wood, p. 370.

Graffion. See Yellow Spanish.

Great Bigarreau, p. 366.

Gridley. Medium, roundish, black; flesh firm, flavor moderate. Late June. Great bearer. Mass.

Guigne Noir Luisante. Medium, round heart-shaped, reddish black; rich, acid. Late July.

Guigne Noir Tardive. See Elkhorn.

Hative. See Early May.

Hildesheim. Medium, heart-shaped, yellow and red; sweet, agreeable.

Hoadley, p. 370.

Holland Bigarreau. See Napoleon Bigarreau.

Holman's Duke. See Mayduke.

Honey. Small, roundish, yellow and red; very sweet. Late.

Hovey, p. 370.

Hyde's Late Black, p. 370.

Hyde's Red Heart. Medium, heart-shaped, lively red; pleasant.

Imperial Morello. Medium, roundish, dark purplish red; acid. Late.

Jeffrey's Duke, p. 375.

Jocosot, p. 365.

Kennicot, p. 365.

Kentish Red. See Early Richmond.

Keokuk. Large, heart-shaped, dark purple, rather coarse, poor. Strong grower; productive. Ohio.

Kirtland's Large Morello. See Large Morello.

Kirtland's Mammoth, p. 371.

Kirtland's Mary, p. 371.

Knevett's Late Bigarreau. See Florence.

Knight's Early Black, p. 366.

Lady Southampton's Yellow. Medium, heart-shaped, all yellow; firm, poor. Late.

Large Black Bigarreau. See Elkhorn.

Large Heart-shaped Bigarreau. See Bigarreau Gros Coeuret.

Large Morello, p. 375.

Large White Bigarreau. See White Bigarreau.

Late Bigarreau, p. 372.

Late Duke, p. 373.

Late Honey. See Honey.

Late Kentish. See Pie Cherry.

Leather Stocking, p. 366.

Lemercier. See Reine Hortense.

Logan, p. 366.

Louis Philippe, p. 373.

Lundie Gean. Medium, roundish, black. July.

Madison Bigarreau. Medium, roundish, yellow and red; pleasant, moderate flavor.
Manning's Late Black, p. 366.
Manning's Mottled, p. 371.
May Bigarreau, p. 366.
May Cherry. See Early May.
Mayduke, p. 373.
Mazzard. See Black Mazzard.
Merveille de Septembre. Small; rather dry, sweet. Of little value. August, September. French.
Mezel, p. 366.
Milan. See Morello.
Monstrous de Bavay. See Reine Hortense.
Monstreuse de Mezel. See Mezel.
Morello, p. 373.
Mottled Bigarreau. See Manning's Mottled.

Napoleon Bigarreau, p. 371.

Ohio Beauty, p. 372.
Osceola, p. 366.
Ox-Heart (of the English). Large, obtuse heart-shaped, dark red; half-tender, of second quality. The name of Ox-heart is erroneously applied here to the White Bigarreau and to several worthless sorts.

Pie Cherry, p. 375.
Pierce's Late. Medium, heart-shaped, amber and dark red; flesh tender, sweet, rich. Late. Mass.
Plumstone Morello, p. 375.
Pontiac, p. 366.
Portugal Duke. See Archduke.
Powhatan, p. 366.
Précoce. See Early May.
President. Large, dark red; half tender, sweet. Late June.
Proudfoot. Large, heart-shaped, dark purplish red; flesh firm, sweet. Late. Ohio.

Red Jacket, p. 372.
Reine Hortense, p. 375.
Remington White Heart. Small, heart-shaped, yellow; flavor poor. Very late. Worthless.
Richardson, p. 366.
Rivers' Early Amber. Resembles Early White Heart, but later.
Rivers' Early Heart. Medium, heart-shaped. Rather early, but poor. English.
Robert's Red Heart. Medium, round heart-shaped, pale amber and pale red; with a good flavor. Late June. Mass.
Rockport Bigarreau, p. 372.
Ronald's Large Black Heart. See Black Tartarian.
Ronald's Large Morello. See Morello.
Royal Duke, p. 373.
Rumsey's Late Morello. Large, roundish heart-shaped; rich red, juicy, acid. Late August. Of little value.

Shannon, p. 373.
Small May. See Early May.
Spanish Black Heart. See Black Heart.
Sparhawk's Honey. Medium, round heart-shaped, regular, pale and bright red; sweet. Late June.
Street's May. See Early White Heart.
Swedish. See Early White Heart.
Sweet Montmorency, p. 372.

Tecumseh, p. 366.
Tobacco-Leaved. Leaves large, fruit small. Worthless.

Townsend, p. 372.
Tradescant's Black Heart. See Elkhorn.
Transparent Guigne, or Transparent Gean. Small, oval heart-shaped, pink and red, pellucid; tender, slightly bitter, becoming rich and good. Rather late. Tree vigorous and productive.
Triumph of Cumberland. See Cumberland's Seedling.

Vail's August Duke, p. 375.
Virginian May. See Early Richmond.

Wax Cherry. See Carnation.
Wendell's Mottled Bigarreau, p. 367.
Werder's Early Black Heart, p. 367.
White Bigarreau, p. 372.
White Tartarian. Rather small, wholly pale yellow, somewhat pellucid, with a moderate, rather bitter flavor. [A spurious White Tartarian, but of better quality, is light pink and red, with a sweet, good flavor.]

Yellow Honey. See Honey.
Yellow Spanish, p. 372.

CURRANTS.

Attractor, p. 430.

Black English, p. 432.
Black Naples, p. 432.
Blanc Transparent. See Transparent.

Champagne. Medium, pink or very pale red; rather acid.
Cherry, p. 431.
Common Black, p. 432.

Fertile Currant of Paluau. See Paluau.
Fertile d'Angers. See Versaillaise.

Gloire des Sablons. Medium, bunches long, loose, white, striped red; acid. Unproductive.
Goliath. See Victoria.
Gondoin Red, p. 431.
Gondoin White, p. 431.

Houghton Castle. See Victoria.

Imperial Yellow, or Imperial White. See White Grape.

Knight's Early Red. Possesses no distinctive merits, being scarcely earlier than other sorts.
Knight's Large Red, p. 431.
Knight's Sweet Red, p. 431.

La Hative. A new French currant of moderate size, productiveness, and quality.
Large-Fruited Missouri. A large-sized variety of the Missouri Currant (*Ribes aureum*), possessing a pleasant flavor.
Le Fertile. Large, deep red, vigorous, very productive.
Long Bunched Red. Resembles Red Dutch, but rather larger in clusters and fruit.

Macrocarpa. Nearly resembles the Cherry Currant, but more productive.

May's Victoria. See Victoria.
Missouri. See Large-Fruited Missouri.
Morgan's Red. See Red Dutch.
Morgan's White. See White Dutch.

Paluau, p. 431.
Pleasant's Eye. See Champagne.
Prince Albert, p. 432.

Red Dutch, p. 432.
Red Grape. See Victoria.
Red Provence. Late, acid; vigorous, shoots reddish.
Reeve's White. See White Dutch.

Striped Fruited. Small, striped, of little value. German.

Transparent, p. 432.

Versaillaise, p. 432.
Victoria, p. 432.

White Antwerp. Large, bunches rather long; sweet, very productive.
White Clinton. Closely resembles, or is identical with White Dutch.
White Crystal. See White Dutch.
White Dutch, p. 432.
White Grape, p. 432.
White Leghorn. See White Dutch.
White Provence. Large white; the most vigorous of the white sorts, but moderately productive. Leaves often edged with white. New.
Wilmot's Red Grape. Resembles May's Victoria; good and productive.

FIG.

See p. 450.

GOOSEBERRIES.

Crown Bob, p. 432.

Downing, p. 434.

Houghton's Seedling, p. 434.

Mountain Seedling, p. 435.

Parkinson's Laurel, p. 433.

Pale Red, p. 435.

Red Warrington, p. 433.
Roaring Lion, p. 433.

Smith's Improved, p. 435.

Wellington's Glory, p. 433.
Whitesmith, p. 434.

GRAPES.

Ada. Bunches large, compact, berries dark; sweet, vinous. Flushing, L. I.

Adirondac, p. 400.
Agawam, p. 404.
Alexander's, p. 400.

Allen's Hybrid, p. 406.
Alvey, p. 400.
Amiens. See Royal Muscadine.
Anna, p. 406.
Ansell's Large Oval Black. See Black Morocco.
Arkansas. Closely resembles, or is identical with Norton's Virginia.
August Muscat. Berries small, oval, black; poor quality. A weak grower. Very early.

Barnes. Bunches and berries medium, black; sweet, good. Quite early. New.
Barry, p. 400.
Black Barbarossa, p. 407.
Black Burgundy. See Black Frontignan.
Black Chasselas. See Black Muscadine.
Black Cluster, p. 407.
Black Corinth; or Zante Currant. Small, round, black; quality moderate.
Black Eagle. Bunch and berries large, oval, black; rich, good—a hybrid. New.
Black Frontignan, p. 407.
Black German. See York Madeira.
Black Grape from Tripoli. See Black Tripoli.
Black Hamburgh, p. 407.
Black Lisbon. See Black Prince.
Black Lombardy, p. 408.
Black Morillon. See Black Cluster.
Black Muscadel. See Black Morocco.
Black Muscat of Alexandria, p. 408.
Black Palestine. See Black St. Peter's.
Black Portugal. See Black Prince.
Black Prince, p. 408.
Black Spanish. See Black Prince.
Black St. Peter's, p. 408.
Black Tripoli, p. 408.
Bland, p. 404.
Bland's Madeira, Bland's Pale Red, and Bland's Virginia. See Bland.
Blood's Black. Large, coarse, foxy. Early.
Blue Trollinger. See Black Hamburgh.
Boston. See Black Prince.
Bowood Muscat. See White Muscat of Alexandria.
Brant, or Arnold's No. 8. Bunch and berry resembling Clinton, but much better in quality. Hardy, strong grower, very early. New.
Brincklé. Bunches large, compact, berries round, black; flesh solid, not pulpy; flavor rich, vinous. Phila.
Brown Hamburgh. See Black Hamburgh.
Bull, or Bullet. See Scuppernong.
Bullitt. See Taylor's Bullitt.

Canada, or Arnold's No. 16. Bunch and berry above medium, black, rich, aromatic. Hardy, moderate grower.
Canadian Chief. Bunches large, shouldered; vine productive. Of foreign origin.
Canby's August. See York Madeira.
Cape Grape. See Alexander's.
Carter. Berries large, round, reddish black, of good quality. Season medium.
Cassady, p. 406.
Catawba, p. 400.
Catawba Tokay. See Catawba.
Charlesworth Tokay, p. 409.
Chasselas Blanc. See Royal Muscadine.
Chasselas de Bar sur Aube. See Royal Muscadine.

Chasselas Musque. See Musk Chasselas.
Chasselas Noir. See Black Muscadine.
Chasselas Royal. See White Sweetwater.
Ciotat, p. 409.
Clara, p. 406.
Clifton's Constantine. See Alexander's.
Clinton, p. 401.
Clover Street Black. Bunches and berries large, black; very good. Cross of native and foreign. Rochester, N. Y. New.
Columbia. Bunches small, compact; berries small, black; pleasant, vinous. Georgetown, D. C.
Concord, p. 401.
Cornucopia, p. 401.
Creveling, p. 401.
Croton, p. 406.
Cumberland Lodge. See Esperione.
Cuyahoga, p. 406.

Damascus. Bunches large; berries very large, black; rather acid. Exotic—requires fire-heat.
Dana. Bunches and berries medium, dark red; slightly vinous, fine. Roxbury, Mass. New.
Delaware, p. 404.
Devereux. Bunches medium; berries small, purple; sweet. Foreign.
Diana, p. 404.
Diana Hamburgh, p. 404.
Dracut Amber. A brown fox, somewhat resembling but not equal in flavor to the Northern Muscadine.
Dutch Sweet Water. Bunches medium; berries large, oval, amber; good early white grape. Foreign.

Early Black Bordeaux, p. 408.
Early Black July, p. 408.
Early Chasselas. See Early White Malvasia.
Early Sweetwater. See White Sweetwater.
Early White Malvasia, p. 409.
Early White Muscadine. See White Sweetwater.
Early White Teneriffe. See Royal Muscadine.
Elsinborough, or Elsinburgh, p. 401.
Emily. Berries rather small, pale red, excellent; of foreign parentage. A worthless native also has this name.
Esperione, p. 408.
Essex, p. 401.
Eumelan, p. 401.

Fintindo, p. 408.
Flame-colored Tokay. See Lombardy.
Fox Grape. A name applied to the several wild varieties of Vitis Labrusca at the North, usually possessing a strong musky aroma; and to the Scuppernong at the South.
Framingham. Medium, black, very early; quality moderate. Mass.
Franklin. Bunches medium; berries rather small, bluish purple; rather acid, moderately good. A strong grower and productive.

Garrigues. See Isabella.
Genuine Tokay. See White Tokay.
Gibraltar. See Black Hamburgh.
Goethe, p. 405.
Golden Chasselas. See Royal Muscadine.
Golden Champion, p. 409.
Golden Clinton. A greenish white seedling of the Clinton. Rochester, N. Y.

Graham. Bunches medium, shouldered, not compact; berries round, purple, little or no pulp, good. Pa.
Gros Colman. Bunches large; berries large, round, black. Foreign. New.
Grove End Sweetwater. See Early White Sweetwater.
Grizzly Frontignan, p. 409.

Hall's Grape. Berries medium, dark; quality and season medium. Ohio.
Hardy Blue Windsor. See Esperione.
Harris. Medium, black; sweet, with pulp. Productive. Southern.
Hartford Prolific, p. 401.
Heath. See Delaware.
Herbemont, p. 402.
Howell. Bunches and berries medium, black; skin thick, pulp firm, good. Early. New.
Hudson. Resembles Isabella, but not so rich and sprightly. Hudson, N.Y.
Hyde's Eliza. Intermediate in appearance between Isabella and Clinton. Growth not as strong as Isabella, but earlier.

Iona, p. 405.
Isabella, p. 402.
Israella, p. 402.
Ives' Seedling. Early, black, hardy; for wine. New. Popular. Western.

Joslyn's St. Alban's. See Musk Chasselas.
July Grape. See Early Black July.

Labé. Bunches medium; berries large, black, pleasant. Pa.
Lady Downes', p. 408.
Large German. See York Madeira.
Le Cœur. See Black Morocco.
Le Cour. See Musk Chasselas.
Lenoir, p. 402.
Lindley, p. 405.
Logan, p. 402.
Lombardy, p. 409.
Longworth's Ohio. See Ohio.
Louisa. See Isabella.
Lunel. See White Muscat of Alexandria.
Lydia, p. 406.
Lyman. Bunches small, compact; berries round, smooth, black; resembles Clinton in flavor.

Macready's Early. Bunches compact; berries white, pointed; juicy, melting, pleasant. Foreign.
Madeira Wine Grape. See Verdelho.
Madeleine. See Early Black July.
Malaga. See White Muscat of Alexandria.
Malmsley Muscadine. See Ciotat.
Mammoth Catawba. Bunches large, not compact; berries large, round, red—does not equal Catawba in flavor.
Marion. Bunches rather large, compact; berries medium, black, purple, with bloom; flavor sharp. Of the Clinton family; becomes eatable in winter.
Marionport. See York Madeira.
Martha, p. 406.
Mary, p. 406.
Mary Ann. Bunches large, oblong oval, black; sweet, very foxy. Early.
Massachusetts White. A large, light brown fox—of little or no value.
Massasoit, p. 405.
Maxatawney, p. 406.
Meade's Seedling. Closely resembles its parent, the Catawba, but a little darker and better. Mass.
Merrimac, p. 402.
Michigan, p. 405.

Miles. Bunches and berries medium, oblong oval, black; sweet, good. Very early. Strong grower. Pa.
Miller's Burgundy, or Miller's Grape, p. 409.
Miner's Seedling. See Venango.
Missouri, p. 403.
Mottled, p. 403.
Muscat Noir. See Black Frontignan.
Muscat d'Alexandrie. See White Muscat of Alexandria.
Muscat Blanc. See White Frontignan.
Muscat Hamburgh. See Black Hamburgh.
Muscat Rouge. See Grizzly Frontignan.
Musk Chasselas, p. 410.

Nonantum. Bunches small, berries good size; black, free from pulp; good. Mass. New.
Northern Muscadine, p. 405.
Norton's Seedling; or Norton's Virginia, p. 403.

Ohio, p. 403.
Oporto. A native with small bunches, and rather small berries, dark; acid. Claimed as good for wine, its only merit.

Palestine. Bunches immense; berries small, amber; sweet. Foreign.
Parsley-Leaved Muscadine. See Ciotat.
Pauline. Bunches large, compact, shouldered; berries medium, brownish red; sweet without pulp. Southern.
Payn's Early. See Isabella.
Perkins. A brown fox grape, resembling Northern Muscadine, but lighter colored and inferior in quality.
Pitmaston White Cluster, p. 410.
Poonah. See Black Lombardy.
Portuguese Muscat. See White Muscat of Alexandria.
Powell. See Bland.
Prince Albert. See Black Barbarossa.
Purple Hamburgh. See Black Hamburgh.
Purple Urbana. See Logan.

Raabe, p. 403.
Raisin de Calabre. Large, round, white; sweet, firm. Keeps well.
Raisin de Cuba. See Black Lombardy.
Raisin des Carmes. See Black Lombardy.
Raisin d'Espagne. See Black Morocco.
Rebecca, p. 407.
Red Chasselas, p. 409.
Red Frontignac of Jerusalem. See Black Muscat of Alexandria.
Red Hamburg. See Black Hamburgh.
Red Muscat of Alexandria. See Black ditto.
Red Traminer, p. 409.
Rogers' Hybrids, p. 405.
Rose Chasselas. See Red Chasselas.
Royal Muscadine, p. 410.
Royal Vineyard. Bunches and berries large, amber; rich, aromatic. Foreign. New.

Salem, p. 405.
Schiras, p. 409.
Scuppernong, p. 407.
Segar Box. See Ohio.
Senasqua, p. 403.
St. Catherine. Bunches and berries large; sweet, tough, very foxy.

St. Peter's. See Black St. Peter's.
Stillward's Sweetwater. See White Sweetwater.
Striped Muscadine. See Aleppo.
Switzerland Grape. See Aleppo.
Syrian, p. 410.

Tasker's Grape. See Alexander's.
Taylor's Bullitt, p. 407.
Telegraph, p. 403.
To-Kalon, p. 403.
Trebbiano. Resembles Syrian, but better—keeps well. Foreign.
Trentham Black. Resembles Black Prince—better in quality. Foreign.
True Burgundy. See Black Cluster.
Tryon. See York Madeira.
Turner's Black. See Esperione.

Underhill's Seedling. A red or brown fox, with large, round berries, tough pulp, of moderately foxy flavor.
Union Village, p. 403.

Valentine's. See Black Hamburgh.
Variegated Chasselas. See Knight's Variegated Chasselas.
Venango, p. 405.
Verdelho, p. 411.
Victoria. See Black Hamburgh.

Walter, p. 405.
Wantage. See Lombardy.
Warner's Black Hamburgh. See Black Hamburgh.
Warren. See Herbemont.
West's St. Peter's. See Black Lombardy.
White Catawba. Bunches medium, compact; berries large, round, white; sweet. Cin., Ohio.
White Chasselas. See Royal Muscadine.
White Constantia. See White Frontignan.
White Corinth. Bunches compact; sweet, pleasant. Foreign.
White Frontignan, p. 410.
White Gascoigne. Bunches and berries oval, good. Foreign.
White Hamburgh, p. 410.
White Lisbon. See White Hamburgh.
White Muscadine. See White Sweetwater.
White Muscat of Alexandria, p. 410.
White Muscat of Lunel. See White Muscat of Alexandria.
White Nice, p. 411.
White Parsley-Leaved. See Ciotat.
White Portugal. See White Hamburgh.
White Raisin. See White Hamburgh.
White Rissling, p. 411.
White Sweetwater, p. 411.
White Tokay, p. 411.
Wilder, p. 403.
Wilmington. Bunches and berries large, white; acid, showy.
Wilmot's New Black Hamburgh. See Black Hamburgh.
Winchester. See Union Village.
Winnie. See Alexander's.
Winslow. Bunches small, compact; berries small, black; resembles Clinton, but earlier. Ohio.

Yeddo. Bunches medium, berries brown; excellent. Rather late. Quite new.
York Madeira. Bunches short, thick, compact; berries roundish oval; excellent. Productive and hardy. Pa.

Zante Currant. See Black Corinth.
Zinfindal, p. 409.

NECTARINES.

Aromatic. See Early Violet.

Black Murray. See Murry.
Boston, p. 329.
Broomfield. Large, roundish, yellow, with a dull red cheek; rather pleasant. Late. Mass.

Claremont. See Elruge.
Common Elruge. See Elruge.
Cowdray White. See New White.

D'Angleterre. See Newington.
Downton, p. 328.
Du Tilly's. See Duc de Telliers.
Duc de Telliers, p. 329.

Early Black. See Early Newington.
Early Newington, p. 330.
Early Violet, p. 329.
Elruge, p. 329.
Emerton's New White. See New White.

Fairchild's. Small, round, flattened, yellowish green, with a red cheek; flesh yellow; dry, poor. Earliness its only merit.
Fine Gold-Fleshed. See Golden.
Flanders. See New White.
French Newington. See Newington.

Golden. Medium, roundish ovate, yellow, with a scarlet cheek; firm, poor. Late. Cultivated only for its beauty. [Prince's Golden Nectarine resembles this, but is larger, a week later, and has large flowers.]

Hardwicke Seedling, p. 329.
Hunt's Tawny, p. 329.

Lewis. See Boston.
Lucombe's Black. See Early Newington.

Murry. Medium, roundish, pale green with a red cheek; sweet, of good flavor. 20th of August. English. Poor bearer—little known here.

Newington, p. 230.

Oatlands. See Elruge.
Old Newington. See Newington.
Old Roman. See Red Roman.
Old White. See New White.
Orange. See Golden.

Perkins' Seedling. See Boston.
Peterborough. Small, roundish, green; flesh juicy, of tolerable flavor. October.
Pitmaston's Orange, p. 330.

Red Roman, p. 330.
Roman. See Red Roman.

Scarlet Newington. See Newington.
Sion Hill. See Newington.
Smith's Newington. See Newington.
Stanwick. Rather large, roundish oval, greenish white, red in the sun; tender, juicy, rich, sugary.

Temple's. See Elruge.

Violette Hative. See Early Violet.

Williams' Orange. See Pitmaston's Orange.

ORANGES.

See p. 450.

PEACHES.

Abricotée. See Yellow Admirable.

Acton Scott. Medium, rather woolly, nearly white, with a red cheek; flesh pale to the stone, rich, sometimes a little bitter. Early English. Rare here.

Admirable. See Early Admirable.

Admirable Jaune. See Yellow Admirable.

Admirable Tardive. See Belle de Vitry.

Albert's Late Rareripe. Large, yellowish white and red. A Southern variety, where it ripens in September.

Algiers Yellow, or Algiers Winter. See Late Yellow Alberge.

Amelia. Large, roundish oblong, light yellow and crimson; melting, vinous, rich; freestone. Ripens at the North, end of August; at the South, in July.

Amsden. See Appendix.

Anne. See Early Anne.

Apricot Peach. See Yellow Admirable.

Astor, p. 317.

Austin's Late Red. Large, oblong, white and red; clingstone. October. Southern.

Avant Blanche. See White Nutmeg.

Batchelder. Large, round, white with a blush; flesh white; juicy, vinous. End of September. Mass.

Baldwin's Late, p. 321.

Baltimore Beauty, p. 323.

Barrington, p. 317.

Barnard, p. 323.

Baugh, p. 321.

Baxter's Seedling. See Jane.

Belle Bausse. Large, deep red; flesh white; melting, vinous; very good. September. French.

Belle Beauté. See Grosse Mignonne.

Belle de Vitry, p. 314.

Bellegarde, p. 317.

Bergen's Yellow, p. 325.

Blanton Cling, p. 327.

Blood Clingstone, p. 328.

Bordeaux Cling. Large, oval, downy, yellow with a red cheek; flesh yellow, red at stone; juicy, vinous; very good. First of August.

Bourdine. See Late Admirable.

Brevoort, p. 321.

Brevoort's Morris. See Brevoort.

Brentford Mignonne. See Bellegarde.

Brevoort's Seedling Melter. See Brevoort.

Brown Nutmeg. See Red Nutmeg.

Briggs. Large, roundish, bright red on white; juicy, rich. Early September. Mass.

Buckingham Mignonne. See Barrington.

Cambridge Belle. Large, roundish, reddened in the sun; rich, fine; handsome. Early September. Mass.

Carpenter's White, p. 317.

Catherine Cling, p. 326.

Chancellor, p. 322.
Chinese Cling, p. 326.
Chinese Peach. See Flat Peach of China.
Claret Clingstone. See Blood Clingstone.
Clinton. Medium, roundish, red on yellow; juicy; good. Late August.
Col. Ausley's. See Barrington.
Cole's Early Red, p. 317.
Cole's White Melocoton. See Morris White.
Columbia, p. 325.
Columbus June, p. 322.
Cooledge's Early Red Rareripe. See Cooledge's Favorite.
Cooledge's Favorite, p. 317.
Crawford's Early Melocoton, or Crawford's Early, p. 323.
Crawford's Late Melocoton, p. 324.
Cut-Leaved. See Emperor of Russia.

D'Abricot. See Yellow Admirable.
Donahoo Cling, p. 326.
Dorsetshire. See Nivette.
Double Blossomed. Ornamental; fruit rather large, roundish, of poor quality.
Double Flowering Peach. See Double Blossomed.
Double Mountain, p. 314.
Druid Hill, p. 317.
Dwarf Orleans, or Italian Dwarf. Very small, trees dwarf—a curiosity.

Early Admirable, p. 318.
Early Amsden. See Appendix, p. 467.
Early Anne, p. 315.
Early Beatrice. See Appendix, p. 467.
Early Chelmsford, p. 315.
Early Crawford. See Crawford's Early.
Early Louise. See Appendix, p. 467.
Early Malden. Medium, roundish, whitish and red; juicy, sprightly. August. C. W.
Early Newington Freestone, p. 322.
Early Purple, p. 322.
Early Red Nutmeg. See White Nutmeg.
Early Red Rareripe. See Red Rareripe.
Early Royal George. See Royal George.
Early Sweetwater, p. 320.
Early Tillotson, p. 315.
Early White Nutmeg. See White Nutmeg.
Early York. See Large Early York.
Eaton's Golden. Rather large, round, golden yellow; flesh yellow; sweet, juicy, with an apricot flavor. N. C. Late. Valuable.
Edgar's Late Melting. See Chancellor.
Edward's Late White. Large, roundish, white with a red cheek, handsome; sweet, juicy, excellent. Mid-autumn. Ala.
Eliza. Medium, round, yellow and red. Late September. Phila.
Elmira Cling. Large, oval, white, downy; sweet, good. Early August. Miss.
Emperor of Russia, p. 315.

Favorite, p. 318.
Fay's Early Ann, p. 318.
Flater's St. John. Large, resembling Crawford, deep red; flesh yellow; good. Southern. Very early.
Flat Peach of China. Small, very oblate, deeply indented to the stone at base and apex, yellowish

green and red; juicy, very good. Early September—curious.

Flewellen Cling. Large, round, dark red and yellowish white; juicy, high flavored; clingstone. Early August.

Fox's Seedling, p. 318.

Foster. See Appendix, p. 467.

Freeman. Large, round, yellow and red; flesh yellow. Late. Ill.

Freestone Heath. See Kenrick's Heath.

French Bourdine. See Late Admirable.

French Magdalen. See Magdalen of Courson.

French Mignonne. See Grosse Mignonne.

French Royal George. See Bellegarde.

Fruitland. Large, ovate, greenish white; juicy, vinous. Southern, in September.

Fulkerson, p. 315.

Galande. See Bellegarde.

George the Fourth, p. 318.

Golden Dwarf (Van Buren's). Medium, golden yellow, red cheek; dwarf, four or five feet high. September. Southern—tender and poor North.

Golden Mignonne. See Yellow Alberge.

Gorgas, p. 315.

Grand Admirable. Very large, yellowish white; flesh white, red at stone; very good.

Green Catharine, p. 318.

Green Nutmeg. See Early Anne.

Griffin's Mignonne. See Royal George.

Griffiths. See Susquehanna.

Grimwood's Royal George. See Grosse Mignonne.

Grosse Mignonne, p. 318.

Haines' Early Red, p. 318.

Hales' Early, p. 319.

Hastings' Rareripe, p. 319.

Hatch, p. 324.

Hative de Ferrieres. Medium, roundish, white and rich red; juicy, sweet, rich, vinous; freestone. French.

Heath, p. 327.

Henry Clay, p. 322.

Hoffman's Pound. See Morrisania Pound.

Horton's Delicious. Large, roundish oval; creamy white and faint red; flesh wholly white, excellent; clingstone. October. Ga.

Hovey's Cambridge Belle. See Cambridge Belle.

Hull's Athenian. Very large, oblong, downy, dull red on yellowish white; rich, vinous. October. Ga.

Hyslop, p. 327.

Incomparable. Large, roundish, light red on yellowish white; juicy, melting; moderately good; clingstone. September.

Jackson Cling. Large, oblong, pointed, dark yellow and dark red; firm, red at stone; juicy, rich; excellent. Late August. Ga.

Jaques' Rareripe, p. 324.

Jane. Large, roundish oblate, red on greenish yellow; excellent. Late September. Phila.

Java Peach. See Flat Peach of China.

Jones' Early, p. 319.

Jones' Large Early, p. 322.

Judd's Melting. See Late Admirable.

Kennedy's Cling, or Carolina. See Lemon Clingstone.
Kenrick's Heath, p. 322.

Lady Parham, p. 322.
La Grange, p. 322.
La Royale. See Grosse Mignonne.
Large American Nutmeg. See Early Sweetwater.
Large Early York, p. 319.
Large French Mignonne. See Grosse Mignonne.
Large Newington. See Old Newington.
Large Violet. See Bellegarde.
Large White Clingstone, p. 326.
Large Yellow Rareripe. See Yellow Alberge.
Late Admirable, p. 319.
Late Red Rareripe, p. 319.
Late Yellow Alberge, October Yellow, or Algiers Winter. Medium, roundish, greenish yellow; downy, clingstone; rather sweet. Only for preserving. Of little value.
Lemon Clingstone, p. 327.
Leopold I. Large, roundish, yellow and red; melting, juicy. Rather late. Belgian.
Lincoln, p. 324.
Long Yellow Pineapple. See Lemon Cling.

Madeline de Courson. See Magdalen of Courson.
Magdalen of Courson, p. 316.
Malta, p. 316.
Mammoth. See Early Chelmsford.
Mellish's Favorite. See Noblesse.
Merriam, p. 324.
Mignonne. See Grosse Mignonne.
Molden's White. Large, oblong, whitish; flesh wholly white; juicy, sweet, excellent. Late September.
Monstrous Pavie. See Pavie de Pomponne.
Montgomery's Late, p. 323.
Moore's Favorite, p. 319.
Moore's June. Rather small, round, yellowish and red; juicy, vinous; good. Ga. Late June.
Morris' Red Rareripe, p. 319.
Morris White, p. 323.
Morrisania Pound, p. 320.
Motteux. See Late Admirable.
Mountain Rose. Large, roundish, skin nearly white, with dark red cheek; flesh white; sweet, juicy; very good. Rather early. Of high promise. New. N. J.
Mrs. Poinsette, p. 324.

Narbonne. See Late Admirable.
Neil's Early Purple. See Grosse Mignonne.
New Cut-Leaved. See Emperor of Russia.
New York Rareripe, p. 319.
New York White Clingstone. See Large White Cling.
Nivette, p. 320.
Noblesse, p. 316.
Noisette, See Chancellor.
Nutmeg, Red. Very small, roundish, pointed, yellow and red; flesh yellowish white; flavor moderate. Late July.
Nutmeg, White. Very small, roundish oval, whitish; flesh wholly white; mild, pleasant. Late July.

Oldmixon Clingstone, p. 326.
Oldmixon Freestone, p. 320.
Old Newington, p. 326.
Orange Clingstone, p. 327.
Owen. Large, roundish, yellow and dark red; flesh yellow; juicy, rich, delicious. Late September. Mass.

Owen's Lemon Rareripe. See Owen.

Pavie Admirable. See Incomparable.
Pavie de Pompone, p. 327.
Pavie Monstreux. See Pavie de Pompone.
Picquet's Late. Quite large, round, yellow and red; flesh yellow; melting, rich; very good. Southern. September.
Pineapple Cling. See Lemon Cling.
Poole's Large Yellow, p. 324.
Poole's Late Yellow Freestone. See Poole's Large Yellow.
President, p. 320.
President Church, p. 323.
Prince's Climax. Large, oval, yellow and red; rich, aromatic; clingstone. Late September. L. I.
Prince's Excelsior. Very large, round, bright orange; flesh wholly yellow; rich, aromatic. October. L. I.
Prince's Paragon. Large, oval, yellowish green and red; juicy, rich. September.
Prince's Red Rareripe. See Prince's Paragon.
Purple Alberge. See Yellow Alberge.

Rareripe, Late Red, p. 319.
Red Alberge. See Yellow ditto.
Red Avant. See Nutmeg, Red.
Red Cheek Melocoton, p. 324.
Red Heath. See Heath.
Red Rareripe, p. 316.
Reeves' Favorite, p. 324.
Richmond. Medium, round, yellow, with red cheek; flesh yellow; melting, very good. Late. Lyons, N. Y.
Rodman's Cling, p. 327.
Ronald's Mignonne. See Bellegarde.
Rose. See Strawberry.
Rosebank. Large, round, red on greenish white; juicy, rich; very good. Late August. C. W.
Royal Charlotte, p. 316.
Royal George, p. 316.
Royal Kensington. See Grosse Mignonne.
Royale. See Late Admirable.

Scott's Early Red, p. 320.
Scott's Magnate, p. 323.
Scott's Nectar, p. 320.
Scott's Nonpareil, p. 324.
Selby's Cling. See Large White Cling.
Serrate Early York, p. 316.
Shanghae, p. 327.
Smith's Favorite, p. 325.
Smith's Newington, p. 326.
Smock Freestone, p. 325.
Snow, p. 323.
Strawberry, p. 323.
Stetson's Seedling, p. 320.
Stump the World, p. 320.
Sturtevant. Resembles Bergen's Yellow, slightly larger; hardy, vigorous, productive. New.
Susquehanna, p. 325.
Sweetwater. See Early Anne.
Sweetwater, Early, p. 320.

Tippecanoe, p. 328.
Titus. Large, roundish, yellow and red; juicy, rich; excellent. Late September. Phila.
Troth's Early, p. 321.
Tuft's Rareripe, p. 325.

Unique. See Emperor of Russia.

Van Buren's Golden Dwarf. Medium, ovate, yellow; clingstone;

quality poor. Southern. Tree small or dwarf; tender and valueless at the North.
Vanguard. See Noblesse.
Van Zandt's Superb, p. 321.

Walberton Admirable, p. 317.
Walter's Early, p. 321.
Ward's Late Free, p. 321.
Washington, p. 321.
Washington Clingstone, p. 328.
White Avant. See White Nutmeg.
White Blossomed Incomparable. Large, oval, white; flesh white; juicy, pleasant. September.
White Imperial, p. 321.
White Melocoton. See Morris White.

Yellow Admirable, p. 325.
Yellow Alberge, p. 325.
Yellow Pineapple. See Lemon Clingstone.
Yellow Rareripe, p. 325.

PEARS.

Abbé Edouard. Medium, obovate, bright green becoming yellow; juicy, half-melting, agreeable. November. Belgian.
Abbott, p. 269.
Adams, p. 258.
Adélaide de Rèves. Medium, roundish, green becoming yellow; very juicy, melting, rich, vinous. Oct. Belgian.
Alexander. Medium, oblong obovate, greenish and russet; juicy, melting, rich, very good. October. N. Y.
Alexandre Lambre, p. 291.
Alexandrina. Medium, roundish, obovate, yellow, with a red cheek; melting, rich; very good. September.
Almond Pear. See Beurré Amandé.
Alpha, p. 258.
Alphonse Karr. See Soldat Laboureur.
Althorpe Crassane. Medium, roundish ovate, pale green; juicy, not rich. October.
Amadotte. Large, pyriform; coarse; juicy, often stringent and worthless. October.
Ambrosia. Medium, roundish obovate; buttery, without much flavor. September. French.
Amire Joannet. Small, short pyriform, greenish yellow, crimson dotted; becoming mealy. Middle of July. Worthless and superseded.
Amory. See Andrews.
Ananas. See Henry IV. and Ananas d'Eté.
Ananas de Courtral. Turbinate pyriform, yellow; firm; buttery, juicy, pleasant. August.
Ananas d'Eté, p. 258.
Andrews, p. 258.
Angleterre. Medium, pyriform, dull green; juicy, melting, pleasant, not rich. September.
Arbre Courbre. Medium, pyriform, greenish; coarse; half-melting, astringent. September.
Aston Town. Small, roundish, yellow; rather sweet. September.

Auguste de Maraise. Large, pyriform, rough brown; buttery, juicy, sweet. October. Belgian.

August Royer, p. 269.

Augustus Dana, p. 269.

Autumn Colmar, or Colmar d'Eté. Conic, greenish yellow; coarse; juicy, astringent; rots. September. [Another Autumn Colmar is medium, pyriform, green; rich, agreeable. October.]

Autumn Paradise, p. 258.

Bankerbine. Medium, obovate, greenish yellow; coarse, breaking. October.

Baronne de Mello, p. 259.

Barry, p. 259.

Bartlett, or Williams' Bonchretien, p. 250.

Bartram. Medium, obovate pyriform, pale yellow; juicy, melting, excellent. September. Phila.

Beadnell. Medium, turbinate, yellowish green and red; juicy, melting. September.

Beauchamps. See Bergamotte Cadette.

Beau Present d'Artois. Large, pyriform, yellow; granular, sweet; rots at core. September.

Belle Angevine. See Pound.

Belle de Bruxelles, or Belle d'Août. Large, pyriform, yellow; sweet, poor. A handsome, worthless sort.

Belle de Flandres. See Flemish Beauty.

Belle de Noël; or, Belle Après Noël. See Fondante de Noël.

Belle Epine Dumas. See Dumas.

Belle et Bonne. Large, roundish, greenish; rather coarse; buttery, sweet. September. Belgian.

Belle Fondante. Medium, conic turbinate, yellow russet; buttery, juicy, rich, slightly astringent. October.

Belle Julie. Small, obovate, light green; melting, buttery, sweet, perfumed. October.

Belle Lucrative, p. 269.

Belle Williams. Large, pyriform, greenish yellow; buttery, melting; very good—has cracked badly at some places. Winter.

Bellissime d'Eté. See French Jargonelle.

Bellissime Jargonelle. See French Jargonelle.

Belmont. Medium, roundish obovate, yellow green; coarse; juicy, sweet. October. An English cooking pear.

Benoist. Medium, turbinate; yellow with a red cheek; melting, sweet, agreeable. August.

Bergamot, Easter. Medium, roundish obovate, pale green; crisp, juicy, pleasant. Late winter.

Bergamot, Gansel's, p. 284.

Bergamot, Hampden's. Large, roundish, yellow; a little coarse; breaking and buttery, if house-ripened. September.

Bergamot, Summer. Small, round, yellowish green; juicy, rich, becoming mealy. Late July.

Bergamotte Cadette, p. 269.

Bergamotte de la Pentecôte. See Easter Beurré.

Bergamotte de Millepieds. Medium, roundish, dark green; melting, juicy; very good. September. French.

Bergamotte de Soulers. See De Sorlus.

Bergamotte d'Esperen. Medium,

flattened pyriform, green, rough; sweet, rich, juicy, spicy. December to February. French.

Bergamotte d'Eté. See Hampden's Bergamot.

Bergamotte d'Hollande. Rather large, roundish, green and russet, becoming yellow; crisp, juicy, agreeable. Through winter till Spring.

Bergamotte Gaudry. Medium, roundish, yellowish green, coarsely dotted; very juicy, mild sub-acid.

Bergamotte Heimbourg. Large, roundish, rough, green becoming yellow; buttery, juicy, rich, perfumed. October. French.

Bergamotte Leseble. Medium, oblate, yellow, partly russeted; juicy, sweet, melting, perfumed. October.

Bergamotte Suisse. Medium, roundish, pale green, yellow and pale red; melting, sweet, pleasant. October.

Bergen Pear, p. 259.

Berriays. Medium, obovate, pyriform, pale greenish yellow; juicy, sweet; very good. September. French.

Beurré Amandé. Medium, long pyriform, dull green, rough; buttery, juicy; very good. September. Belgian.

Beurré Ananas. See Ananas d'Eté.

Beurré Audusson. See Ridelle's.

Beurré Bachelier, p. 259.

Beurré Beauchamps. See Bergamotte Cadette.

Beurré Beaulieu. Medium, roundish conic, greenish yellow and russet; rather coarse; buttery, melting, vinous. October.

Beurré Bennert. Small, melting. Mid-winter; hardy. Belgian.

Beurré Benoist; or Benoits. Medium, obovate, green and russet; melting, very juicy, perfumed. September.

Beurré Berckmans, p. 269.

Beurré Blanc. See White Doyenné.

Beurré Bolwiller. A baking pear—not valuable.

Beurré Bosc, p. 259.

Beurré Bretonneau. Large long pyriform, variable, rough, yellow with a brown cheek; half-melting, not juicy, rich, vinous, perfumed. Late winter. Belgian.

Beurré, Brown, p. 271.

Beurré Burnicq. Medium, turbinate pyriform, rough, russeted; flesh greenish white; juicy, rich, perfumed. Late October. Belgian.

Beurré Charneuse. See Duc de Brabant.

Beurré Citron. Medium, obovate, green becoming yellow; juicy, sub-acid. February, March. Belgian.

Beurré Clairgeau, p. 286.

Beurré Colmar. Medium, oval, pale green, becoming yellow; flesh white; juicy, melting, perfumed. October. Belgian.

Beurré Comice de Toulon. Large, oblong obovate, yellow; juicy, melting. November.

Beurré d'Alençon. See Holland Bergamot.

Beurré d'Amalis, p. 269.

Beurre d'Anjou, pp. 270, 291.

Beurré d'Aremberg, p. 287.

Beurré de Beaumont. See Bezi Vaet.

Beurré de Brignais. See Des Nonnes.

Beurré de Capiaumont, p. 261.

Beurré d'Elberg. Large, obtuse pyriform, pale yellow; rather coarse, juicy, sweet, perfumed. November. Belgian.

Beurré de Fontenay. See Beurré Gris d'Hiver.

Beurré d'Hardenpont. See Glout Morceau.

Beurre d'Hiver. See Chaumontelle.

Beurré de Koning. Medium or large, roundish oblate, yellowish green and russet; juicy, melting, vinous, delicate. October. Belgian.

Beurré de Malines. See Winter Nelis.

Beurré de Montgeron, or New Frederick of Wurtemburg. Medium, pyriform, yellow and orange; melting, half buttery, rich, perfumed. Late September.

Beurré de Nantes. See Beurré Nantais.

Beurre de Pâques. See Easter Beurré.

Beurré de Quenast. Obovate, yellowish; juicy, melting, sweet, pleasant.

Beurré de Ranz. See Beurré Rance.

Beurré de Rhine. Large, pyriform, irregular, light yellow; coarse; good. October.

Beurré Diel, p. 259.

Beurré Duhaume. Medium, oblate, rough, with some russet; coarse; buttery, melting, vinous. Winter.

Beurré Duval, p. 259.

Beurré Easter, p. 292.

Beurré Fougière. Medium, obovate, greenish yellow; granular, sweet; good. October.

Beurré Gens. Medium, conic obovate, greenish, rough; sugary, rich; excellent. September.

Beurré Giffard, p. 250.

Beurré, Golden, of Bilboa, p. 275.

Beurré Goubault, p. 283.

Beurré Gris. See Beurré, Brown.

Beurré Gris de Lucon. See Beurré d'Hiver.

Beurré Gris d'Hiver, p. 291.

Beurré Haggerston. See Limon.

Beurré Hamecher. Medium, long oval, slightly pyriform; melting, rich; excellent. October, November. Belgian.

Beurré Hardy, p. 270.

Beurré Kennes, p. 259.

Beurré Kenrick. Medium, greenish yellow; juicy, buttery, sweet. September. Flemish.

Beurré Knox. Large, oblong obovate, pale green; juicy, sweet, not rich. September. Flemish.

Beurré Kossuth. Large, variable, turbinate, yellowish green; buttery, very juicy; faintly sub-acid, very good. September. October. Frênch.

Beurré Langelier, p. 287.

Beurré Leon le Clerc. Rather large, oval, approaching long pyriform, yellowish green, strongly dotted; juicy, melting, sweet, but not rich. October.

Beurré Mauxion. Medium, roundish oblate, yellow and thin russet; melting, sugary, aromatic, and perfumed; very good. September.

Beurré Millet of Angers. Medium, conic, angular, greenish yellow and brown russet; buttery, very juicy, vinous, sometimes astringent. December.

Beurré Moire, p. 259.

Beurré, Mollett's Guernsey. Medium, oval pyriform, yellowish green, somewhat russeted; melting, rich, buttery, vinous. December. English.

Beurré Nantais, p. 260.

Beurré Navez, p. 271.

Beurré Noisette. Medium, obovate, yellow, dotted brown; melting, sprightly; very good. Foreign.
Beurré Oudinot. See Andrews.
Beurré Philippe Delfosse. Medium or large, varying from oblate to pyriform, rich yellow, shaded light red; buttery, melting, very juicy, rich, perfumed. December, January. Belgian.
Beurré Piquery. See Urbaniste.
Beurré Preble, p. 271.
Beurré Rance. Medium, obtuse pyriform, dark green; melting, sweet, rich. Winter. Fine in Europe—mostly fails here except at the South.
Beurré Richelieu. Large, obtuse pyriform, greenish yellow; buttery, sweet, aromatic, sometimes astringent. December.
Beurré Robin. See Doyenné Robin.
Beurré Romain. Medium, obovate, greenish yellow; juicy, sweet, agreeable. September, October.
Beurré Rouge. See Beurré Brown.
Beurré Royale. See Beurré Diel.
Beurré Samoyeau. Medium, yellow, red cheek; buttery, juicy. Mid-autumn.
Beurré Scheidweiller. Medium, obovate pyriform, dull green; buttery, sweet, rich. October.
Beurré Seutin. Medium, oval pyriform; irregular green. A late cooking pear.
Beurré Sieulle. See Sieulle.
Beurré Six. Large, pyriform, green; buttery, melting, rich, perfumed. November, December.
Beurré Sophia. Medium, long pyriform, lemon yellow; buttery, melting, vinous, rich. Early October.
Beurré Soulange, p. 260.
Beurré Spence. Medium, short pyriform, yellow and dull crimson; juicy, melting, rich, vinous. September. Belgian.
Beurré St. Nicholas. See Duchess of Orleans.
Beurré Sterkmans, p. 260.
Beurré Superfin, p. 271.
Beurré Van Marum. Large, oblong pyriform, yellow; rots at core, quality moderate. October.
Beurré, Winter. Medium, long pyriform, greenish, rough; flesh buttery, melting, vinous. January.
Beurré Woronson. Medium, yellow. Great bearer. October.
Beymont, p. 271.
Bezi de Caissoy d'Hiver. Medium, obovate, yellow, rough, russeted; buttery, rich, high flavored. Winter.
Bezi de Chaumontelle. See Chaumontelle.
Bezi d'Heri. Medium, roundish, greenish yellow with a blush; juicy, tender, with an anise-like flavor. Autumn and winter.
Bezi de Montigny. See Countess of Lunay.
Bezi de la Motte. Medium, roundish, light green, strongly dotted; flesh fine grained, buttery, mild, pleasant.
Bezi de Veterans. Large, obtuse pyriform, light yellow, some russet; flesh firm—cooking. Winter.
Bezi Vaet. Medium, obovate, yellowish green, rough; juicy, sweet, perfumed. December.
Bezy d'Esperen. Large, long pyriform, dull yellow and russet; juicy, vinous. October. Belgian.

Bezy Garnier. Pyriform, handsome; breaking, juicy, rich. Late winter.

Bezy Quessoy (or Caissoy) d'Eté. Medium, round oval, russeted, rough; juicy, half melting, rich, perfumed. September.

Bezy Sanspareil. Large, irregular, obscure pyriform, yellowish green; coarse, juicy, buttery, vinous. November.

Bishop's Thumb. Rather large, conic oblong, yellowish green, with a russet cheek; juicy, melting, vinous, slightly astringent. October. English.

Black Worcester, p. 287.

Bleeker's Meadow. Small, roundish, yellow; flesh white, firm, musky, sometimes soft, but mostly remaining hard. October. Pa. Very productive, and valuable for cooking.

Bloodgood, p. 254.

Bon Chrétien, Flemish. Medium, obovate, pale green and brown; crisp, juicy; stews tender. Winter.

Bon Chrétien Fondante, p. 271.

Bon Chrétien, Spanish. Large, pyriform, deep yellow and red; half breaking—cooking.

Bon Gustave. Medium, pyriform, greenish and russet; buttery, juicy, perfumed. December. Belgian.

Bonne Charlotte. Medium, mostly obovate; buttery, rich, perfumed. August.

Bonne du Puits Ansault. Rather small, roundish oblate, greenish yellow; juicy, melting, rich; very good. September. Great bearer. French. New.

Bonne d'Ezee. Large, pyriform, yellowish green, with some russet; juicy, melting, rich; very good. September, October. Often cracks badly.

Bonne de Malines. See Winter Nelis.

Bonne Rouge. See Gansel's Bergamot.

Bonne Sophia. Medium, obovate pyriform, acute, greenish yellow and red cheek; melting, sweet; very good. October.

Boston. See Pinneo.

Boucquia. Rather large, oval turbinate, pale yellow; rots at core; rather astringent. October. Flemish.

Bourgemester. Large, pyriform, light yellow; juicy, astringent. November. Tree cankers badly.

Boussock, p. 271.

Brandywine, p. 251.

Brialmont. Resembles Urbaniste in the character of the tree and fruit; of good promise. October. Belgian.

Broom Park. Medium, roundish, greenish yellow and dull red; coarse; juicy, sweet. January, February. English.

Brougham. Roundish oblate, greenish yellow; coarse; astringent. November. English.

Brown Beurré, p. 271.

Buffum, p. 271.

Burlingame. Medium, oblate, yellow; coarse; poor. September. Ohio.

Burnett. Large, obtuse pyriform, pale yellow; coarse; juicy, sweet; good. October. Mass.

Butter Pear. See White Doyenné.

Cabot, p. 272.

Caen de France. Rather large, pyriform, yellow and russet; half melting, juicy, sweet, slightly astringent. Winter.

Calebasse. Medium, long pyriform, irregular, dull yellow, rough; coarse; juicy, crisp, rich, pleasant. September. Belgian.

Calebasse Bosc. See Autumn Paradise.

Calebasse Delvigne. Medium, pyriform, yellow; coarse; buttery, rich, perfumed, slightly astringent. October.

Calebasse d'Eté. Medium, long pyriform, bright yellowish brown; melting, rich, perfumed. September. Belgian.

Calhoun. Medium, roundish, irregular, yellowish and dull red; coarse, melting, rich, vinous, perfumed. October. Conn.

Cambridge Sugar Pear. See Harvard.

Camerlyn. Medium, pyriform, yellow; melting, rich, aromatic. October. Belgian.

Canandaigua, p. 261.

Capiaumont. See Beurré de Capiaumont.

Capsheaf, p. 272.

Capucin. Medium, oval, yellow with a blush; crisp, juicy, rich, good. October. Belgian.

Cassante de Mars. Obovate, yellow; juicy, rich, vinous, perfumed. Winter. Belgian.

Catherine Gardette. Rather large, roundish obovate, yellow, dotted red; buttery, aromatic, excellent. September. Phila.

Catherine Lambre. Medium, obovate pyriform, greenish yellow; juicy and melting, sweet; very good. October. Belgian.

Catillac, p. 287.

Catinka. Rather small, obovate pyriform, pale yellow; coarse; buttery, juicy, vinous. November. Belgian.

Chancellor, p. 261.

Chaptal. Rather large, pyriform, greenish yellow; half buttery, half hard; tolerably good, rather insipid. February.

Charlotte de Brower. Rather large, roundish oval, rich yellow; juicy, rich, vinous, perfumed. October Belgian.

Charles Frederick. Green becoming yellow; melting, juicy, vinous, perfumed; very good. October. Belgian.

Charles of Austria. Large, roundish, greenish yellow; juicy, astringent. October. Belgian.

Charles Smet. Medium, pyriform, yellow and russet; juicy, sweet, perfumed. January. Belgian.

Charles Van Hooghten. Large, pyriform, dull yellow; buttery, melting, rather sweet. October.

Chaumontelle, p. 287.

Chelmsford. Large, pyramidal, yellow with a red cheek; flesh coarse; sweet—good for cooking. September.

Church, p. 283.

Citron. Small, roundish, greenish; coarse; juicy, vinous, musky. August, September. Conn.

Citron de Carmes. See Madeleine.

Clara. Medium, oval, pyriform, yellow, dotted red; melting, juicy, sweet, faintly acid. Belgian.

Clapp's Favorite, p. 251.

Clay. Medium, obovate, yellow; coarse; juicy, rich, perfumed. October. Conn.

Clion. See Vicar of Winkfield.

Clinton. Large, yellow; buttery, not rich. November. Belgian.

Coffin's Virgalieu. Rather large; sweet, juicy, not rich. December.

Coit's Beurré. Medium, obovate pyriform, yellow with some russet, crimson dotted; granular; buttery, rich, vinous. September.

Collins, p. 272.

Colmar. Rather large, obtuse pyriform, light yellow; half buttery, melting, juicy, sweet. December. Old. Superseded.

Colmar Bonnet. Medium, conic obovate, pale yellow; buttery, mild, slightly perfumed. Good. November.

Colmar Bosc. See Niell.

Colmar d'Alost. Large, long pyriform, sometimes obovate, greenish yellow and red; flesh buttery, juicy, slightly astringent. October. Belgian.

Colmar d'Aremberg. Large, turbinate pyriform, greenish yellow; quality poor. November.

Colmar d'Eté. Conic, greenish yellow; coarse; juicy, astringent; rots at core. September.

Colmar d'Hiver. See Glout Morceau.

Colmar Epine. Large, roundish oblong, greenish yellow; flesh sweet, melting; good; agreeable. September. Belgian.

Colmar Gris. See Passe Colmar.

Colmar Hardenpont. See Passe Colmar.

Colmar Navez. See Beurré Navez.

Colmar Niell. Large, obovate, pale yellow; buttery, melting. Good. October.

Columbia, p. 291.

Commodore. Medium, obovate, yellow; buttery, melting, sweet; good. November. Belgian.

Comprette. Small, obtuse pyriform, yellowish green; buttery, rich, perfumed. October. Flemish.

Comstock. Medium, obovate, yellow and red; crisp, sweet, sprightly. November.

Comte de Flandre, p. 261.

Comte de Lamy, p. 272.

Comte de Paris, p. 261.

Comte Lelieur. Medium, turbinate, yellowish green and brown; melting, sweet, high flavored. September. Belgian.

Comtesse d'Alost. See Colmar d'Alost.

Conseiller de la Cour, p. 261.

Conseiller Rauwez. Large, oblate, irregular, green, rough; coarse; juicy, perfumed, vinous, slightly astringent. October.

Cooke. Rather large, pyramidal, irregular, pale yellow; juicy, buttery, rich, vinous. October. Va.

Copia. Large, yellow; coarse; rich. October. Phila.

Cornelis, or Desirée Cornelis. Large, obovate pyriform, greenish yellow; melting, buttery, sweet, perfumed. August, September. A new, promising Belgian pear.

Cóter, p. 292.

Count Coloma. See Urbaniste.

Countess of Lunay, p. 261.

Crassane. Medium, roundish, greenish yellow; juicy, sweet, moderately pleasant. October.

Crassane d'Hiver. Medium, half melting, high flavored. Winter.

Crawford. Medium, obovate, light yellow; flesh buttery, sweet, moderately pleasant. August. Scotch.

Croft Castle. Medium, roundish, greenish yellow; juicy, crisp, sweet. October. English.

Cross, p. 294.
Cumberland. Rather large, obovate, orange yellow; buttery, moderately juicy. October. R. I.
Cushing, p. 273.

Dallas, p. 273.
Dana's Hovey, p. 292.
Davis. Small, roundish, variable, russeted; buttery, gritty at core; vinous; good. October. Pa.
Deans. See White Doyenné.
Dearborn's Seedling, p. 255.
De Bavay. Rather large, pyriform, yellow; juicy, melting, vinous. October. Belgian.
Delices de Charles. Medium, pyramidal, yellowish green; juicy, melting, vinous—like Brown Beurré. December. Belgian.
Delices d'Hardenpont of Angers, p. 273.
Delices d'Hardenpont of Belgium. Large, conic pyriform, greenish yellow, rough; buttery, melting, juicy, sweet, rich, aromatic. November, December. Belgian.
Delices de Jodoigne. Rather large, yellowish green; half melting, rich; very good. October.
De Louvain. Medium, obovate pyriform, light yellow; buttery, melting, rich, perfumed, excellent. October. Belgian.
Democrat. Medium, greenish yellow. Late August. A strong grower. Pa.
Désirée Cornelis. Large, pyriform, greenish yellow; sweet, agreeable. August, September. New. Foreign.
De Sorlus. Large, ovate, pyriform, light green becoming yellow; juicy, melting, pleasant, deficient in flavor. Early Winter.
De Spoelberg. See Vicomte de Spoelberch.
Des Nonnes, p. 283.
De Tongres, p. 261.
Deux Sœurs. Large, long pyriform, green; juicy, very rich, with an almond flavor. November. Belgian.
Diel. See Beurré Diel.
Dix, p. 262.
Dikeman. Medium, oblate, yellow; juicy, melting, rich, vinous, perfumed. October. Conn.
Diller. Rather small, round, yellowish; granular; juicy, sweet, perfumed. Early September.
Docteur Bouvier. Large, long pyriform, light green, a little russet; juicy, half melting, agreeable, vinous. February. Belgian.
Docteur Capron. Medium, obovate, greenish yellow, partly russeted; melting, pleasant, sprightly. October. Belgian.
Docteur Lentier. Medium, pyriform, greenish yellow; buttery, juicy, perfumed. Very good. November.
Docteur Trousseau. Large, obovate, green dotted red; buttery, juicy, rich. November, December. Belgian.
Doctor Reeder. Small, roundish ovate, yellow, netted with russet; melting, buttery, sugary, perfumed. Very good. November. Good bearer. Seneca Co., N. Y.
Double Philippe. See Boussock.
Douillard. Rather large, turbinate; juicy, melting, perfumed. Very good.
Dow. Medium, obovate, pyriform or conic, yellowish green, rough, partly russeted; juicy, melting,

vinous, sometimes astringent. September, October. Conn.

Dowlin. See Uwchlan.

Doyenné Blanc. See White Doyenné.

Doyenné Boussock. See Boussock.

Doyenné Boussock Nouvelle. See Boussock.

Doyenné d'Alençon, p. 292.

Doyenné d'Eté, p. 256.

Doyenné d'Hiver. See Easter Beurré.

Doyenné d'Hiver d'Alençon. See Doyenné d'Alençon.

Doyenné d'Hiver Nouveau. See Doyenné d'Alençon.

Doyenné Defais, p. 273.

Doyenné Dillen, p. 273.

Doyenné Downing, p. 273.

Doyenné du Comice, p. 262.

Doyenné Goubault, p. 287.

Doyenné Grey, p. 275.

Doyenné Gris. See Grey Doyenné.

Doyenné Gris d'Hiver Nouveau. See Doyenné d'Alençon.

Doyenné Musque. See Bezi de Montigny.

Doyenné Robin, p. 284.

Doyenné Rose. Rather large, obovate, yellow and crimson; coarse, granular; flavor poor; rots at core. October.

Doyenné Rouge. See Grey Doyenné.

Doyenné Sieulle. See Sieulle.

Doyenné, White, p. 282.

Duc d'Aumâle. See Gedeon Paridant.

Duc de Bordeaux. See Dumas.

Duc de Brabant, p. 263.

Duchesse d'Alost. See Colmar d'Alost.

Duchesse d'Angoulême, p. 263.

Duchesse d'Aremberg. Large, pyriform, dull green; coarse; tender, juicy, of moderate quality. Hardy, vigorous, productive. September.

Duchesse de Berri d'Eté, p. 257.

Duchesse de Brabant. See Soldat Laboreur.

Duchesse de Mars. Rather small, roundish obovate, dull yellow with russet; melting, juicy, perfumed. October. French.

Duchesse d'Orleans, p. 263.

Duchesse Heléne d'Orleans, p. 273.

Dumas, p. 263.

Dumortier, p. 273.

Dundas, p. 273.

Dunmore, p. 273.

Dupuy Charles. Medium, conic pyriform, yellow, rough, russeted; melting, juicy, rich. Very good. November. Belgian.

Durandeau. See De Tongres.

Early Catharine. See Early Rousselet.

Early Rousselet. Rather small, pyriform, yellow and brownish red; sweet, pleasant, perfumed; rots at core. August.

Eastern Belle. Medium, obovate pyriform, yellow, some russet; sweet, rich, musky; very good. September. Maine.

Eastnor Castle. Medium, roundish, green; juicy, melting. December.

Echassery. Medium, roundish oval, greenish yellow; melting, buttery, sweet. Winter. French.

Edmonds, p. 274.

Edwards. Medium, round, yellow; granular—baking. Conn.

Edwards' Henrietta, p. 255.

Elizabeth, Edwards'. Medium, obtuse pyriform, angular, greenish yellow; buttery, sub-acid; good. October. Conn.
Elizabeth, Manning's, p. 255.
Ellis. Rather large, pyriform, yellowish green; juicy, melting, vinous. Early October. Mass.
Emile d'Heyst, p. 263.
Emile Bivort. Medium, conic oblate, orange yellow and russet; juicy, rich, vinous. November.
Emerald. Medium, obovate, green; melting, buttery, sweet. December. Belgian.
Enfant Prodigue. Rather small, pyriform, green, rough, russeted; granular, juicy, vinous, perfumed. October. Belgian.
English Bergamot. See Autumn Bergamot.
Epine d'Eté, or Summer Thorn. Medium, pyriform, greenish yellow; melting, sweet, musky. Early September.
Episcopal. See Fortunée.
Esperione. Medium, obovate, slightly pyriform, yellow; juicy, melting, perfumed. September.
Eugene Appert. Medium, roundish, rough, brownish yellow; melting, sweet, perfumed, excellent.
Excellentissima. See Duc de Brabant.
Eyewood. Medium, oblate, dull yellow with some russet; buttery, good. English.

Feaster. See Bleeker's Meadow.
Ferdinand de Meester. See Rousselet de Meester.
Figue, p. 263.
Figue d'Alençon, p. 263.
Figue de Naples, p. 275.
Fin Or d'Hiver. See Franc Real d'Hiver.
Fine Gold of Summer. Small, roundish, yellow with a red cheek; juicy, good, not rich. August.
Flemish Beauty, p. 275.
Fleur de Neige, or Snow Flower. Rather large, conic pyriform, yellowish green; granular; sweet, high-flavored. October. Belgian.
Florimond Parent. Very large, pyramidal pyriform, tapering to crown, green becoming deep yellow; coarse; melting, rich, perfumed. September. Belgian.
Fondante Agréable. Medium, roundish obovate, yellowish green; juicy, melting, refreshing. August.
Fondante d'Automne. See Belle Lucrative.
Fondante de Malines, p. 275.
Fondante de Noel, p. 288.
Fondante des Charneuse. See Duc de Brabant.
Fondante des Pres. Medium, obovate pyriform, yellow; melting, juicy, sweet, aromatic. October. Belgian.
Fondante Van Mons. Rather small, roundish, pale yellow; juicy, melting, sweet, agreeable. November.
Fondante du Comice. Large pyramidal (small specimens obovate), yellow; buttery, juicy, rich, vinous. October, November. French.
Foote's Seckel. Small, obovate, yellow and brownish red, and russet; juicy, melting, vinous; very good. September. Mass.
Forelle, p. 263.
Forme de Delices. Medium, obovate, yellowish, rough; buttery, rather dry, sweet. October. Flemish.

Fortunée. Rather small, roundish, russeted; juicy, sprightly—cooking. Winter.

Foster's St. Michael. Medium, roundish ovate, yellow; coarse; astringent. September.

Franc Real d'Eté. See Summer Franc Real.

Franc Real d'Hiver. Medium, roundish, yellow and brown; crisp—cooking. Winter.

Frankford. See Bleeker's Meadow.

Frederick of Wurtemburg. Large, broad pyriform, yellow with crimson cheek; juicy, melting; varying from excellent to worthless. September. Belgian.

Frederika Bremer. Rather large, varying from roundish to pyriform, greenish yellow; melting, vinous. October. N. Y.

Fulton, p. 284.

Gansel's Bergamot, p. 284.

Gansel's Late Bergamotte. Roundish, greenish, rough; granular; juicy, sugary, perfumed. December.

Gansel's Seckel. Rather small, oblate, yellow, rough, with russet; coarse; buttery, melting, rich, aromatic. November.

Gedeon Paridant. Medium, obtuse pyriform, greenish yellow; juicy, melting, brisk, excellent. September. Belgian.

Gendesheim. Large, obtuse pyriform, greenish yellow; of moderate quality. October, November. Flemish.

General Bosquet. Large, pyriform, green; melting; very good. September.

General Canrobert. Medium, obovate pyriform, yellow. January. French.

General de Lourmel. Medium, obovate, greenish; juicy, melting. November.

Gen'l Lamoricière. Medium, ovate, greenish yellow and russet; flesh juicy, melting, rich, brisk, perfumed, sometimes astringent. October.

General Taylor. Rather small, turbinate, cinnamon russet; granular, buttery, melting, aromatic; very rich, excellent. November.

General Totleben. Rather large, pyriform, greenish yellow, netted with russet; juicy and melting; very good. October.

Gerardin. Medium, roundish, irregular, yellow with russet; granular, astringent. September.

Gilogil. Large, roundish, russeted; crisp—cooking. Winter. French.

Glout Morceau, p. 288.

Goodale. Large, pyriform (short Bartlett shaped), handsome; very good. Tree vigorous, hardy, productive—from seed of the McLaughlin. Maine. S. L. Goodale.

Golden Beurré of Bilboa, p. 275.

Grand Soleil, p. 292.

Graslin, p. 264.

Great Citron of Bohemia. Small, oblong, yellow; coarse, of little flavor. September.

Green Chisel. An erroneous name for Madeline; also the name of a small, roundish, green, summer pear, of a sweet but poor flavor.

Green Mountain Boy. Medium, round, obovate or pyriform, rich, yellow; melting, juicy, sweet; good. October.

Green Sugar. Rather small, oblate turbinate, green; juicy, melting, pleasant. October.
Green Sylvange. See Sylvange.
Green Yair. Medium, obovate, green; juicy, of moderate flavor. September.
Grey Butter Pear. See Grey Doyenné.
Grey Doyenné, p. 275.
Gros Dillen. See Beurré Diel.
Gros Rousselet d'Août. Medium, pyriform, yellow; melting, juicy, vinous, perfumed. August. Belgian.
Grosse Calebasse of Langelier. See Van Marum.
Grosse Marie. Medium, oblate pyriform, russeted; juicy, rich, perfumed, with a vinous flavor.
Groom's Princess Royal. Medium, roundish, greenish brown; buttery, melting, sweet, high flavored. Winter. English.
Guernsey. See Stevens' Genesee.
Gustin's Summer. Small, roundish, yellow; sweet, with little flavor. September.

Hacon's Incomparable. Rather large, roundish turbinate, yellowish green and brown, partly russeted; buttery, melting, vinous. October. English.
Haddington. Rather large, obovate pyriform, greenish yellow; crisp, aromatic—baking. Winter. Phila.
Hagerman, or Hegeman, p. 275.
Hanners, p. 275.
Hanover. Small, roundish obovate, green; melting, juicy, pleasant. October. N. J.
Harrison's Large Fall. Large, yellow—valued only for baking.
Harvard, p. 264.
Hawes' Winter. Large, roundish, dull yellow; coarse; juicy, rich, vinous. December. Va.
Hazel. See Hessel.
Heathcot, p. 275.
Hélène Grégoire. Medium, pyriform, greenish yellow; juicy, melting, sweet; very good. October. Belgian.
Henkel, p. 276.
Henrietta. See Edwards' Henrietta.
Henri Bivort. Large, Doyenné-form, greenish yellow and brown; melting, buttery, juicy, sweet, perfumed. September. Belgian.
Henri Quatre. See Henry the Fourth.
Henri Van Mons. Medium, pyriform (nearly Tyson shaped), yellowish with a blush; buttery, vinous, perfumed, agreeable. October.
Henry the Fourth, p. 276.
Hericart, p. 276.
Hericart de Thury. Large, pyriform (Bosc shaped), rough, light brown; buttery, rich. January. Belgian.
Hessel. Small, obovate, yellowish green—of little value. September. Scotch.
Holland Bergamot. Rather large, roundish, greenish yellow, partly russeted; crisp, very juicy, sprightly, agreeable. Keeps till spring.
Hooper's Bilboa. See Golden Beurré of Bilboa.
Hovey. Medium, pyriform, yellow; melting, juicy, rich, vinous. French.
Howell, p. 276.

Huguenot. Medium, roundish, pale yellow, dotted red; breaking, sweet, rather dry. October. Mass.

Hull, p. 276.

Huntington, p. 284.

Hunt's Connecticut. Medium, oblate, yellowish green; coarse, sweet, dry—culinary.

Huyshe's Prince Consort. Medium, pyriform, greenish yellow; buttery, a little coarse, half melting; very good. November. English. New.

Imperatrice de France. See Flemish Beauty.

Inconnue Van Mons, p. 288.

Indian Queen. Rather large, long pyriform, greenish yellow, a brown cheek; a little coarse; half melting, sweet, not rich, soft. A market sort. September. Maine.

Ives' Bergamot. Rather small, roundish, greenish yellow; juicy, melting, aromatic. Early September. Conn.

Ives' Pear. Small, turbinate, irregular, greenish and brownish red; juicy, melting; good. Early September. Conn.

Ives' Seedling. Rather small, round, greenish yellow and crimson; granular; juicy, melting, perfumed. Early September. Conn.

Ives' Virgalieu. Small, pyriform, greenish and dull crimson; granular; melting, vinous, refreshing. October. Conn.

Ives' Winter. Medium, short pyriform, yellowish, russeted; coarse. December. Conn.

Jackman's Melting. See King Edwards.

Jackson. Medium, oblate approaching turbinate, greenish yellow and russet; juicy, brisk, vinous. September. N. H.

Jalousie. Rather large, roundish obovate, slightly pyriform, russeted; coarse; sweet, deficient in flavor. Handsome and worthless. September.

Jalousie de Fontenay Vendée, p. 276.

Jaminette, p. 288.

Jargonelle, English, or Epargne. Rather large, long pyriform, acute, greenish yellow and dull brown; flesh rather coarse; juicy, pleasant, refreshing, sub-acid. Three weeks earlier than Bartlett. French origin.

Jargonelle, French. Medium, obovate, greenish yellow, with a red cheek; breaking, sweet; rots at core. Handsome, but poor. Early August.

Jean de Witte, p. 292.

Jersey Gratioli. Medium, conic oblate, greenish, rough, partly russeted; juicy, brisk, vinous. September.

Joanette. See Amiré Joannet.

Johonnot, p. 276.

Jones' Seedling, p. 292.

Josephine. See Jaminette.

Josephine de Malines, p. 295.

Jules Bivort, p. 277.

Julienne, p. 252.

July Pear. See Sugar Top.

King Edwards. Large, pyriform, yellow with a red cheek; buttery; sometimes good. October.

King's Seedling. Medium, oblate, yellowish green, rough; granular; juicy, aromatic, perfumed. October.

Kirtland, or Kirtland's Seckel, p. 277.
* Kingsessing, p. 277.
Knight's Monarch. Large, obovate, yellowish brown. Does not ripen in the Northern States. Winter. English.
Knight's Seedling. Medium, oblate, turbinate, rough, yellowish green; juicy, sweet. October. R. I.

La Herard. Rather large, pyriform, pale yellow and brown; melting, juicy, sub-acid, pleasant; very good. October. Belgian.
La Juive. Medium, turbinate, green and brown; melting, juicy, rich, perfumed. November. Belgian.
Las Canas, p. 288.
Latch. See Philadelphia.
Laure de Glymes, p. 277.
Lawrence, p. 288.
Lebanon. See Pinneo.
Le Curé. See Vicar of Winkfield.
Leech's Kingsessing. See Kingsessing.
Lee's Seckel. Medium or rather large, obovate, rich russet; buttery, rich, perfumed, excellent. September.
Leon le Clerc. Rather large, obovate, greenish yellow, russet at the end; flesh crisp, firm, of moderate quality—cooking. Winter.
Leopold First. Large, turbinate, pyriform, green; melting, sweet, perfumed. December. Belgian.
Lewis, p. 293.
Liberale. Rather large, long pyriform, greenish yellow, partly russeted; juicy, sweet, rich, aromatic. October.
Lieutenant Poitevin. Large, greenish yellow; juicy, half melting. Late winter. French.
Limon, p. 255.
Little Muscat. Quite small, turbinate, yellow with brownish cheek; breaking, sweet, slightly musky. Middle of July. French. Tolerably good.
Little Musk, or Primitive. See Little Muscat.
Locke's Beurré. Medium, roundish, obovate, dull green; juicy, vinous, November. Mass.
Lodge, p. 264.
Long Green, p. 264.
Long Green of Autumn, p. 264.
Louis Dupont. Medium, obovate, green becoming yellow; melting, juicy, sweet, perfumed. October.
Louise Bonne. Large, pyriform, pale green; coarse; melting, moderately good. December.
Louise Bonne d'Avranches. See Louise Bonne of Jersey.
Louise Bonne of Jersey, p. 264.
Louise d'Orleans. See Urbaniste.
Lycurgus, p. 289.
Lyon, p. 278.

Mabille. See Beurré Diel.
Madame Ducar. Medium, oval, green becoming yellow; very juicy, rich, perfumed. August. Belgian.
Madame Eliza, p. 264.
Madame Henry Desportes. Medium, yellow, melting, juicy. Mid-autumn.
Madame Millet. Medium, obovate, rich russet; half melting, rich, perfumed, agreeable. March. French.
Madame Treyve. Medium, obovate,

pale greenish yellow; flesh greenish white; juicy, melting, and rich; very good. Last of August. Great bearer. French.

Madeleine, or Magdalen, p. 252.

Madotte. See Amadotte.

Malconnaitre d'Haspin. Large, roundish obovate, dull yellow, with a brown cheek; juicy, rich, melting, sub-acid, perfumed. October.

Mansuette. Large, short pyriform, greenish yellow; juicy, astringent —baking. September.

March Bergamotte. Rather small, green, partly russeted; coarse, flavor moderate. English.

Maréchal de la Cour. See Conseiller de la Cour.

Maréchal Dillen. Large, somewhat obovate, very irregular, pale green; buttery, juicy, rich. November. Belgian.

Maréchal Pelissier. Medium, ovate, yellow and red. Late September. French.

Marianne de Nancy. Large, pyriform, yellowish green, thickly dotted; coarse, juicy, often poor.

Marie Louise, p. 265.

Marie Louise Nova. Rather large, pyriform, yellow, with a brown cheek; melting; sometimes good, quickly decays. September. Belgian.

Marie Parent. Large, pyriform, rich yellow; juicy, rich, perfumed; very good. October. Belgian.

Martha Ann, or Dana's No. 1. Medium, long obovate, yellow; juicy, sub-acid, pleasant. November. Mass.

Martin Sec. Small, somewhat pyriform, deep yellow, russet and crimson; granular, half breaking, agreeable—cooking. December.

Mather. Rather small, obovate, russeted and reddish; buttery, pleasant. August. Pa.

Maynard. Medium, obovate pyriform, yellow with a red cheek; juicy, rich. Late July.

McLaughlin, p. 289.

McVean. Large, oblate pyriform, yellow; juicy, astringent. October. Monroe Co., N. Y.

Merriam, p. 284.

Messire Jean. Medium, turbinate, yellow and russet; gritty; juicy, breaking, sweet. November. French.

Michaux. Medium, round, yellowish green; sweet, of moderate quality. Early October.

Mignonne d'Hiver. Medium, obovate pyriform, rough, russet; granular, rich, brisk, astringent. November. Belgian.

Miel de Waterloo. See Duc de Brabant.

Miller's Early. See Summer Portugal.

Millot de Nancy, p. 265.

Mitchell's Russet. Rather small, inclining to conic obovate, dark russet, rough; melting, rich, perfumed. November. Ill.

Moccas. Medium, obovate, green; juicy, not rich. December.

Monseigneur des Hons. Rather small, pyriform, greenish yellow with some russet; buttery and melting, sweet, good, of moderate quality. August. French.

Moore's Pound, p. 278.

Moor-fowl Egg. An incorrect name for Swan's Egg.

Monseigneur Affre. Medium, roundish, rough greenish russet; granular; rich, perfumed. November.
Morgan. Large, oblate, greenish yellow; flesh white, a little gritty; sweet, juicy, vinous. October. N. C.
Mount Vernon, p. 280.
Moyamensing, p. 255.
Muscadine, p. 255.
Muscat Petit. See Little Musk.
Muscat Robert. Rather small, greenish yellow; juicy, pleasant. Late July.
Musk Summer Bon Chrétien. See Summer Bon Chrétien.
Muskingum, p. 257.

Nabours. Rather large, greenish yellow; juicy, buttery, sweet. Strong grower. Ga.
Napoleon, p. 265.
Naumkeag. Medium, roundish, yellow russet; melting, astringent. October. Mass.
Negley. Rather large, obovate pyriform, yellow and bright crimson, fair and handsome; firm; juicy, rich. September. Pittsburgh, Pa. New.
Ne Plus Meuris. Rather small, roundish, irregular, dull yellowish brown, partly russeted; agreeable. Winter. Belgian.
Newtown Virgalieu. An early winter baking pear. L. I.
Nickerson. Rather large, resembling Louise Bonne of Jersey; very good. Tree vigorous, hardy, productive. S. L. Goodale. Me. New.
Niell. Large, obovate, slightly pyriform, pale yellow; juicy, sweet, agreeable. Late September. Belgian.
Nouveau Poiteau, p. 265.

Oliver's Russet. Rather small, roundish, yellow and rich brown russet, rough; coarse, flavor moderate. Late September.
Omer Pacha, p. 278.
Onondaga, p. 265.
Ontario, p. 265.
Orange Bergamot. Medium, broad turbinate, yellow, rough; firm; acid—baking. September.
Orpheline Colmar. Large, pyriform, green becoming yellowish, with some russet; melting, juicy, sweet, perfumed; handsome and very good. October. Belgian.
Osband's Summer, p. 255.
Osborne. Medium, short pyriform, yellowish green; juicy, brisk. September. Indiana.
Oswego Beurré, p. 278.
Oswego Incomparable. Very large, obovate pyriform tapering to crown, yellow; coarse; pleasant, of moderate quality. September.
Ott, p. 256.

Pardee's Seedling. Small, roundish, greenish yellow, much russeted; granular; melting, vinous, perfumed. October. Conn.
Pailleau. Medium, turbinate, greenish yellow, partly russeted, rough; coarse; juicy, sweet. Early September. Belgian.
Payency, properly Payenche, p. 266.
Paradise d'Automne. See Autumn Paradise.
Parsonage, p. 266.
Passe Colmar, p. 289.
Passe Colmar Gris. See Passe Colmar.
Pater Noster, p. 290.

Paul Ambre. Medium, obovate, sometimes pyriform, greenish yellow and gray russet; buttery, melting, aromatic. October.

Paul Thielens. Large, conic obovate, yellowish; melting, slightly coarse, pleasant. November. Belgian.

Peach Pear. Medium, conic, turbinate, yellow; melting, rich, vinous. Late August. Belgian.

Pendleton's Early York. Rather small, obovate, slightly pyriform, yellow; melting, sweet. Late July. Conn.

Pengethly. Medium, oval, light green, thickly dotted; coarse; juicy, sweet; good. February. English.

Pennsylvania. Medium, obovate, brown russet on dull yellow; rather coarse; half melting; moderately good. Late September. Phila.

Petit Marguerite. Rather small, short obovate, pale yellow; juicy, melting, perfumed; good. August. French.

Petit Rousselet. See Rousselet de Rheims.

Petre, p. 278.

Philadelphia, p. 278.

Philippe Goes. Medium, turbinate pyriform, rough, russeted; juicy, sweet, perfumed; very good. November. Belgian.

Pinneo, p. 256.

Pitmaston Duchesse. Large, obtuse pyriform, uneven, yellow, with some red and russet; half melting, vinous; good. October. English. New.

Pius IX. Large, conic oblate, somewhat pyriform, yellow; granular; rich; good. Late September. A good market pear, of moderate flavor.

Pitt's Prolific. Medium, oblong pyriform, yellow; coarse; sweet; rather poor. September.

Plombgastel. See St. Michael Archangel.

Pocahontas. Medium, obovate, or turbinate pyriform, yellow; melting, sweet, musky. Early October. Mass.

Poire d'Abondance. Rather large, oblong pyriform, pale yellow; melting, juicy, sweet, excellent. October.

Poire d'Albret or Beurré d'Albret. Medium, pyramidal, rough, brown russet; coarse; juicy, vinous, rich, perfumed. October.

Poire d'Avril. Large, roundish conic, greenish yellow; granular; juicy, sweet, agreeable—baking. November to February.

Poire de Chasseurs. Medium, short pyriform, greenish yellow; juicy, buttery, perfumed, vinous. October. Belgian.

Poire de Lepine. Small, oblate, yellowish and red; granular; melting, vinous, perfumed. November.

Poire Guillaume. See Bartlett.

Poire Neige. See White Doyenné.

Pope's Quaker. Medium, oblong pyriform with yellow russet; juicy, pleasant. October. L. I.

Pound, p. 290.

Pratt, p. 266.

Prevost. Medium, rich yellow with a red cheek; sweet, perfumed. Winter. Belgian.

Primitive. See Little Musk.

Prince Albert. Medium, pyriform, yellowish; melting, rich. February. Belgian.

Princess Charlotte. Medium, short pyriform, greenish; of little value here. October. Belgian.

Princess Maria. Rather small, pyramidal yellow, mostly russeted; coarse; sweet, agreeable. October. Belgian.

Princess of Orange. Medium, roundish, russeted; crisp, juicy, astringent. October. Flemish.

Pulsifer, p. 252.

Queen of the Low Countries, p. 266.

Quinnipiac. See St. Ghislain.

Rallay. Medium, short pyriform, yellow, thinly russeted; buttery, melting; good. Winter.

Rapelje. Medium, varying from obovate or turbinate to pyriform, yellowish, russeted; juicy, varying from a rich aromatic to a poor flavor. September. L. I.

Raymond, p. 278.

Read's Seedling. See Oswego Beurré.

Reading, p. 290.

Reine Caroline. Medium, narrow, pyriform, yellow with a red cheek; crisp, dry, poor. November.

Retour de Rome. Medium, oblate, yellowish, partly russeted; granular; melting, vinous. September. Belgian.

Richards. Rather large, obovate, yellow; granular; melting, vinous. October. Del.

Richardson's Seedling. Rather large, obovate, yellow; melting, sprightly, pleasant. October.

Ridelle's. Medium, oblate turbinate, yellow and bright red; of moderate quality. September. Belgian.

Roe's Bergamotte, p. 284.

Ropes. Medium, obovate, russeted; rich, perfumed; good. October. Mass.

Rosabirne. Medium, pyriform, greenish, russeted; juicy, vinous, somewhat astringent. October.

Rostiezer, p. 252.

Rousselet Esperen. Pyriform, turbinate, yellow; juicy, vinous, perfumed. September.

Rousselet de Meester. Medium, roundish, yellow with a red cheek; coarse, not rich. October. Belgian.

Rousselet de Rheims. Small, obovate pyriform, yellowish green; sweet, aromatic—rots at core. Early September. French.

Rousselet Hatif. See Early Rousselet.

Rousselet Stuttgart. Below medium, conic, greenish with a brown cheek; juicy, sweet, aromatic—rots at core. Late August.

Rousselet Vanderwecken. Small, roundish or obovate, yellow; juicy, aromatic, perfumed; very good. November.

Rutter. Medium, round obovate, greenish yellow; partly melting, sweet; very good. October. West Chester, Pa.

Sabine. See Jaminette.

Salisbury Seedling. Short pyriform, partly russeted; coarse; rather poor. October. N. Y.

Sam Brown. Medium, roundish, pale yellow, thin russet; juicy and melting, vinous, rich; very good. September. Md.

Scotch Bergamot. See Hampden's Bergamot.

Seckel, p. 278.

Selleck, p. 267.
Serrurier, p. 279.
Sheldon, p. 284.
Shenks. See Hosenshenck.
Shepard, p. 279.
Simon Bouvier. Small, pyriform, green; melting, perfumed. September. Belgian.
Sieulle, p. 295.
Sickel. A corruption of Seckel.
Skinless, p. 252.
Smith's Bordenave. See Lodge.
Snow Flower. See Fleur de Neige.
Soldat Laboureur, p. 267.
Souvenir d'Esperen, p. 267.
Souvenir du Congress. Very large, long, pyriform; yellow; buttery, melting, quality moderate. August and September. French. New.
Souveraine d'Eté. Medium, conic obovate, light yellow, crimson dotted; melting, rich, vinous. Early September.
Souveraine d'Hiver. See Passe Colmar.
Souveraine de Printemps. Medium, oblate, ribbed, yellow; granular; melting, vinous, somewhat astringent. March.
Spice, or Musk Pear. See Rousselet de Rheims.
St. Andre, p. 279.
St. Dennis. Small, turbinate, ribbed, yellowish and red; sweet, aromatic. Late August.
St. Dorothée. Large, pyriform, tapering to crown, greenish yellow; juicy, melting, rich, sweet, perfumed. October.
St. Germain, p. 290.
St. Germain, Brande's, p. 291.
St. Germain, Prince's, p. 293.
St. Ghislain, p. 267.
St. Lambert. See English Jargonelle.
St. Menin. Large, long, pyriform, yellowish green; melting, juicy; very good. September.
St. Michael. See White Doyenné.
St. Michel Archange, p. 267.
St. Vincent de Paul. Small, russet. January. French.
Sterling, p. 279.
Stevens' Genesee, p. 285.
Stone: Large, pyriform, yellow; buttery, slightly astringent. August. Ohio.
Styer. Medium, roundish, greenish yellow; buttery, melting, very rich, perfumed. September. Pa.
Styrian. Large, pyriform, deep yellow with a red cheek; crisp, rich. October. English.
Sucrée de Hoyerswerda. Small, obovate, yellowish green; juicy, sweet, sprightly. Late August. German.
Sugar Top. Medium, obovate turbinate, yellow; of rather dry, sweet flavor, moderate or poor. Late July.
Sullivan. Medium, oblong pyriform, greenish yellow; juicy, sweet, pleasant. September. Belgian.
Supreme de Quimper, p. 253.
Surpasse Crassane. Resembling the old Crassane, but more productive, healthy and vigorous. Belgian.
Surpasse Meuris. Medium, conic, rough, russeted; melting, vinous. October.
Summer Bell, or Windsor. Large, pyriform, regular, yellowish green; tender, coarse, astringent—rots at core. Tree a handsome grower and great bearer. Late August.
Summer Bergamot. Small, round, greenish yellow; juicy, rich, becoming dry. Early August.

Summer Beurré d'Aremberg. Rather small, short pyriform, pale greenish yellow, with some nettings of russet; a little coarse; melting, sweet, very good. Mid-autumn. English.

Summer Bon Chrétien. Large, pyriform, ribbed, rich yellow with a reddish cheek; breaking; very juicy, sweet. Formerly much valued, now generally destroyed by black mildew. Early September.

Summer Doyenné, p. 256.

Summer Franc Real. Medium, obovate, slightly pyriform, yellowish green; fine grained, buttery, sweet, pleasant. Early September.

Summer Portugal, p. 258.

Summer Rose. Medium, roundish, yellowish; of poor quality. Late August.

Summer St. Germain. Medium, obovate, green; juicy, slightly acid. Late August.

Summer Thorn. See Epine d'Eté.

Superfondante. Medium, obovate, pale yellow; buttery, melting, good. October.

Surpasse Virgalieu, p. 279.

Suzette de Bevay, p. 290.

Swan's Egg. Small, oval, pale green; juicy, sweet, slightly musky. October.

Swiss Bergamot. Medium, roundish, slightly turbinate, pale green and pale red; melting, sweet, agreeable. October.

Sylvange. Roundish obovate, pale green; melting, sweet, agreeable. October. Keeps well.

Tarquin des Pyrenees. Large, pyriform, green; quality poor—great keeper.

Taylor Pear. Medium, roundish oblate, green; buttery, vinous, with vanilla flavor. Early winter. Va.

Tea, p. 279.

Theodore Van Mons, p. 267.

Therese Appert. Medium, pyriform, deep yellow with some russet, a rich brown cheek; juicy, melting; very good. September. New. French.

Thompson's, p. 279.

Thuerlinck. Very large, but of little value. Belgian.

Tillington. Small, obovate, dark green, rough; coarse, of moderate quality. October. English.

Totten's Seedling. Rather small, turbinate pyriform, pale yellow; buttery, melting, vinous, perfumed. Early October. Conn.

Triomphe de Jodoigne, p. 267.

Trout Pear. See Forelle.

Tyler. Small, turbinate, yellow; granular; melting, brisk, vinous. October.

Tyson, p. 253.

Uvedale's St. Germain. See Pound.

Upper Crust. Rather small, obovate, green, partly russeted; buttery, melting; very good. July at the South—not good North.

Urbaniste, p. 267.

Uwchlan, p. 257.

Vallée Franche. Medium, obovate, greenish yellow; juicy, sweet, flavor rather poor. Early September.

Van Assche, p. 279.

Van Buren. Large, obovate, yellow with a blush; crisp, sweet, perfumed. Handsome—of mode-

rate quality. An excellent culinary sort. New Haven, Conn.

Van Marum. Large, pyriform with a long neck, bronze-colored; coarse, fibrous; not juicy, pleasant—baking. Late autumn.

Van Mons Leon le Clerc, p. 268.

Vauquelin. Rather large, obovate; juicy, sub-acid. Winter.

Vermillion d'en Haut. Medium, pyriform (Tyson-shaped), pale yellow, a red cheek; fine, juicy, sweet. Very good. September. French.

Verte Longue. See Long Green.

Verte Longue of Angers, p. 268.

Vezouziere. Rather small, roundish oval, yellowish; juicy, melting, sweet, agreeable. September.

Vicar of Winkfield, p. 290.

Vicompte de Spoelberch, p. 293.

Virgalieu. See White Doyenné.

Wadleigh. Rather small, roundish obovate, yellow; melting, juicy. Very good. Early September. N. H.

Walker. Large, oblong, pyriform, greenish yellow; a little coarse; half melting, sweet, good. Oct. Belgian.

Walker's Seedling. See Mount Vernon.

Washington, p. 280.

Waterloo. See Duc de Brabant.

Wendell. Medium, pale yellow, often with a red cheek; melting, juicy, not rich. Late August. Belgian.

Westcott, p. 281.

Wharton's Early. Rather large, obovate pyriform, yellowish green; melting, juicy, sweet. Late August.

Wheeler. Medium, roundish obovate, yellowish green; coarse; juicy, perfumed. Early September. R. I.

White's Seedling. Medium, roundish obovate, greenish yellow; juicy, good. New Haven, Conn.

Wiest. Medium, roundish, oval, green; melting, sub-acid, pleasant. September. Pa.

Wilbur, p. 281.

Wilkinson, p. 281.

Williams' Early. Small, roundish turbinate, bright yellow, dotted red; juicy, rich, slightly musky. Early September. Mass.

William Edwards. Medium, obtuse pyriform, yellow, thickly dotted; buttery, sweet. September. Conn.

Williams' Bonchrétien. See Bartlett.

Williamson. Medium, obovate, rich yellow, thickly dotted; fine grained; juicy, rich. October. L. I.

Willermoz, p. 290.

Wilmington, p. 268.

Wilkinson, p. 281.

Windsor. See Summer Bell.

Winship's Seedling. Medium, conic pyriform, yellow; juicy, pleasant. Late summer. Mass.

Winter Bergamot. See Easter Bergamot.

Winter Nelis, p. 291.

Winter Seckel. Medium, oblate, yellowish brown, partly russeted; juicy, rich, sweet, aromatic. February. Va.

Wolaston. See Glout Morceau.

Wredow. Medium, oblate approaching pyriform, greenish yellow and russet; juicy, melting, rich, vinous. October.

Yat. Small, turbinate, brown russet; juicy, perfumed—rots at core. September.

Yellow Butter. See White Doyenné.

York Bergamot. See Autumn Bergamot.

Zepherin Gregoire, p. 294.

Zepherin Louis Gregoire. Medium, turbinate, yellow with a red cheek; very juicy, slightly perfumed. December.

Zoar Beauty. Medium, pyriform, light yellow, with a red cheek; partly melting, sweet, moderately good—rots at core. August. Ohio.

PLUMS.

Abricotée Rouge. Medium, oval, red and violet; sweet, dry, poor.

Agen Datte. See Prune d'Agen.

Albany Beauty, p. 350.

Amber Primordian. See Primordian.

American Wheat. Small, roundish, pale blue; juicy, sweet. Late August. Great bearer.

American Yellow Gage. See Prince's Yellow Gage.

Angelina Burdett. Medium, round, nearly black, thickly dotted; rich, excellent. English. September.

Apple Plum. Medium, roundish, reddish, purple; slightly coarse; sprightly. September. Mass.

Apricot, p. 350.

Autumn Gage, p. 350.

Beekman's Scarlet. See Lombard.

Belgian Purple. Medium, roundish, purple; a little coarse; juicy, sweet, rich. September.

Belle de Septembre. Very large, oval, reddish brown; culinary. October.

Bingham, p. 351.

Black Damask. Medium, roundish, greenish yellow; juicy, sweet, rich. August.

Black Damson. See Damson.

Black Imperial. See Bradshaw.

Black Morocco. See Morocco.

Bleecker's Gage, p. 350.

Bleecker's Scarlet. See Lombard.

Blue Gage. Small, round, dark blue; slightly acid; moderately rich. Of little value. August.

Blue Holland. See Holland.

Blue Imperatrice, p. 337.

Blue Perdrigon. Medium, oval, reddish purple; flesh firm; sugary—clingstone. August.

Bolmar, or Bolmar's Washington. See Washington.

Bradford Gage. See Green Gage.

Bradshaw, p. 337.

Brevoort, or Brevoort's Purple Bolmar, p. 338.

Bricetta. Medium, roundish oval, yellow dotted red; juicy, rich; very good. September.

Bruyn Gage. See Green Gage.

Buel's Favorite, p. 351.
Burgundy Prune. Medium, ovate, necked, reddish black; juicy, rich, pleasant—freestone. September.
Burrette's. Large, long oval, dull yellow; melting, sweet, aromatic. September.
Bayfield. Small, round, light yellow; good—clingstone. August.

Caledonian. See Goliath.
Catalonian. See Primordian.
Cherry, p. 338.
Cheston. Rather small, oval, dark purple; flesh firm; sweet, sprightly—freestone. July and August.
Cloth of Gold. See Drap d'Or of Esperin.
Coe's Golden Drop, p. 351.
Coe's late Red, p. 339.
Columbia, or Columbian Gage, p. 339.
Corse's Admiral. Rather large, oval, light purple; juicy, sprightly, moderate flavor. September. Montreal.
Corse's Field Marshal. Rather large, oval, purplish red; juicy, sub-acid. August. Montreal.
Corse's Nota Bene, p. 339.
Cruger's Scarlet Gage, or Cruger's Seedling, p. 339.

D'Agen. See Prune d'Agen.
Damask. See German Prune.
Damson, p. 339.
Dana's Yellow Gage, p. 351.
De Delice, p. 339.
De Montfort, p. 340.
Denniston's Albany Beauty, p. 350.
Denniston's Red, p. 340.
Denniston's Superb, p. 351.
Diamond. Very large, oval, black; coarse; acid, dry. September.
Diaprée Rouge. See Red Diaper.
Dictator. Very large, brownish purple; rich, juicy, high flavored. Montreal.
Domine Dull, p. 340.
Downton Imperatrice, p. 351.
Drap d'Or, p. 351.
Drap d'Or of Esperen, p. 351.
Duane's Purple, p. 340.
Dunmore. Small, ovate, green becoming yellow; juicy, sweet, aromatic—freestone. October.
Dutch Prune. See Domine Dull.
Dutch Quetzen. See Domine Dull.

Early Cross. Rather small, roundish, reddish purple; sweet; good—clingstone. August. Mass.
Early Damask. See Morocco.
Early Damson. See Damson.
Early Royal. See Royal Hative.
Early Royal of Nikita. Small, roundish, reddish purple; juicy, sweet, high flavored—partly freestone. August.
Early Scarlet. See Cherry.
Early Tours, p. 340.
Early Violet. See Early Tours.
Early Yellow. See Primordian.
Early Yellow Prune, p. 351.
Egg Plum. See White Egg.
Elfrey's Prune. Small, oval, blue; sweet, dry, firm—freestone. August.
Emerald Drop. Medium, long oval, yellowish green; clingstone. August.
English Wheat. Medium, roundish oval, reddish purple; juicy, sweet, rich—clingstone. August.

Fellenberg, p. 340.
Flushing Gage. See Imperial Gage.

Foote's Early Orleans. Medium, roundish, oval, black; early; good, not rich; hardy, productive. Mass.
Fotheringham, p. 340.
Franklin. See Washington.
Frost Gage, p. 341.
Fulton, p. 352.

Galbraith. Large, oval, purple; very good. Growth straggling. A valuable early sort.
German Gage. See Bleecker's Gage.
German Prune, p. 341.
General Hand, p. 352.
Gifford's Lafayette. Medium, oval, purple; juicy, not rich. August.
Golden Cherry Plum. See Cherry.
Golden Gage. See Coe's Golden Drop.
Goliath, p. 341.
Green Gage, p. 352.
Gundaker Prune. Medium, oval, purple; high flavored. Good bearer. Pa.
Guthrie's Apricot. Medium, roundish oval, yellow, crimson dotted; coarse; juicy, sweet, not rich. August.
Guthrie's Late Green. Medium, round, yellow; sweet, rich, rather dry. September.
Guthrie's Topaz. Medium, oval, necked, rich yellow; juicy, sweet, pleasant, not rich. September. Scotch.
Gwalsh. Large, oblong oval, deep purple; coarse; sweet, pleasant. September.

Hampton Court. See Early Orleans.
Hartwiss' Yellow Prune. Medium, oval, waxen yellow; rich, subacid, fine. September. German.
Henry Clay, p. 352.
Highlander, p. 341.
Holland Prune. Roundish purple; sweet, pleasant—freestone. September.
Horse Plum. Medium, oval, purple; dry, rather acid—freestone. August.
Howard's Favorite, p. 353.
Howell's Early, p. 341.
Howell's Large. See Nectarine.
How's Amber. Medium, roundish, light red; coarse, juicy—clingstone. September.
Hudson's Gage, p. 353.
Huling's Superb, p. 353.

Ickworth Imperatrice, p. 341.
Imperial Gage, p. 353.
Imperial Ottoman, p. 354.
Imperial Violet. See Red Magnum Bonum.
Imperial Rouge. See Red Magnum Bonum.
Imperatrice. See Blue Imperatrice.
Isabella, p. 342.
Italian Damask, p. 342.
Italian Prune. See Fellenberg.
Ives' Seedling, p. 354.

Jaune Hative. See Primordian.
Jefferson, p. 354.
Judson, p. 342.

Keyser's Plum. See Huling's Superb.
Kirke's, p. 342.
Knight's Large Drying. See Large Green Drying.

Lady Plum. Small, oval, light yellow, spotted red; acid; freestone. September. Great grower and bearer—culinary. Albany, N. Y.

Langdon's Seedling. Rather large, roundish oval, reddish purple; juicy, sub-acid—mostly clingstone. August. Conn.

La Royale. See Royale.

Large Early Damson. See Horse Plum.

Large Green Drying. Large, round, greenish yellow; rich; very good. September. English.

Lawrence's Favorite, or Lawrence's Gage, p. 355.

Leipzic. See German Prune.

Lewiston Egg. Medium, oval, pale yellow; quality moderate. August.

Little Queen Claude. See English Yellow Gage.

Lombard, p. 342.

Long Scarlet. Medium, oblong obovate, red; acid, ripening sweeter—clingstone. August.

Lucombe's Nonesuch, p. 355.

Madison, p. 355.

Magnum Bonum. See White Egg.

Mamelonnée. Medium, oval with a distinct neck, tapering to apex, light green; sweet, pleasant, mild, not rich—freestone. Early August. French. Valuable for its earliness.

Manning's Long Blue, p. 342.

Marten's Seedling. Large, oblong, yellow; brisk, sprightly flavor—freestone. September. Schenectady, N. Y.

McLaughlin, p. 355.

Meigs, p. 342.

Mimms. See Red Diaper.

Miner. An improved variety of the Wild Chickasaw plum; medium, ovate, dark purplish red; juicy—adheres to the stone. Culinary Tree hardy, vigorous.

Mirabelle, p. 356.

Mirabelle Tardive. Small, roundish oval, greenish yellow; sweet, juicy, agreeable—freestone. Great bearer—hangs long. October.

Miser Plum. See Cherry.

Monroe, or Monroe Egg, p. 356.

Monsieur Hatif. See Early Orleans.

Morocco, p. 343.

Mulberry, p. 356.

Myrobolan. See Cherry.

Nectarine, p. 343.

Nelson's Victory, p. 356.

New York Purple. See Brevoort's Purple.

Old Orleans, or Orleans, p. 343.

Orange, p. 357.

Orleans Early, p. 343.

Orleans, Smith's, p. 348.

Parsonage, p. 357.

Peach Plum, p. 343.

Penobscot. Large, oval, yellow; sweet, pleasant—clingstone. September. Me.

Peoly's Early Blue. Medium, oblong, dark blue; flesh yellow; pleasant—clingstone. August.

Peters' Yellow Gage, p. 357.

Pond's Purple. See Pond's Seedling (American).

Pond's Seedling, p. 343.

Pond's Seedling of Massachusetts, p. 344.

Précoce de Bergthold, p. 357.

Précoce de Tours. See Early Tours.

Primordian, p. 357.

Prince Englebert, p. 344.

Prince of Wales. Large, round, slightly oblong, reddish purple; sweet, sprightly, not rich—clingstone. September.

Prince's Imperial Gage. See Imperial Gage.
Prince's Orange Egg. Rather large, oval, yellow; coarse; sprightly, not rich. September.
Prune d'Agen, p. 344.
Prune d'Allemagne. See German Prune.
Prune d'Ast. See Prune d'Agen.
Prune de la St. Martin. See Coe's Late Red.
Prune de Louvain. Large, ovate, necked, deep purple; coarse; melting, pleasant—freestone. August.
Prune d'Œuf. See Egg Plum.
Prune, Manning's Long Blue, p. 342.
Prune Pêche. See Peach Plum.
Prune Suisse. See Fellenberg.
Purple Damson. See Damson.
Purple Egg. See Red Magnum Bonum.
Purple Favorite, p. 344.
Purple Gage, p. 345.

Quackenboss, p. 345.
Queen Mother. Small, round, pale red and purple; sweet, rich—freestone. September. English.
Quetsche. See German Prune.

Red Diaper, p. 345.
Red Gage, p. 346.
Red Magnum Bonum, p. 346.
Reine Claude. See Green Gage.
Reine Claude de Bavay, p. 357.
Reine Claude Diaphane. Medium, roundish, clear green, shaded red; juicy, sweet, aromatic. September. French.
Reine Claude d'Octobre. Small, roundish, greenish yellow; juicy, rich—freestone. October.
Reine Claude Rouge. Very large, roundish oval, red and purple; rich, slightly acid, aromatic. September.
Reine Claude Violette. See Purple Gage.
Reizenstein's Yellow Prune. Medium, oval, slightly necked, yellow; juicy, pleasant—clingstone. September. Italian.
Rhinebeck Yellow Gage. Large, oval, yellow; coarse; sweet, pleasant — clingstone. September. Rhinebeck, N. Y.
Rivers' Early Favorite, p. 346.
Rivers' Early Prolific. Medium, roundish oval, reddish purple; juicy, sweet, pleasant—freestone. August. English.
Roe's Autumn Gage. See Autumn Gage.
Royale, p. 346.
Royal Hative, p. 347.
Royal Tours, p. 347.

Saint Catherine, p. 358.
Saint Cloud. See Goliath.
Saint Martin's Quetsche, p. 358.
Saint Martin Rouge. See Coe's Late Red.
Saint Maurin. See Prune d'Agen.
Scarlet Gage. See Long Scarlet.
Schuyler Gage, p. 358.
Schenectady Catherine, p. 347.
Sea. Small, round, brownish purple; flesh greenish yellow; sweet, juicy—freestone. August.
Semiana. Medium, oval, necked, deep purple; flesh juicy, sub-acid, moderately rich. Distinct from Blue Imperatrice, which see.
Sharp's Emperor, p. 348.
Shailer's White Damson. See White Damson.

Sheen. See Fotheringham.
Siamese. Medium, obovate, pale yellow; juicy, sprightly, of moderate flavor. Fruit often in pairs—tree a great bearer. September.
Sloe. Ornamental, sometimes used for stocks. Is a distinct species (*Prunus Spinosa*). The fruit is small and black; often called Blackthorn.
Small Green Gage. See Yellow Gage. English.
Steer's Emperor. See Goliath.
Suisse, p. 348.
Sucrin Vert. See Green Gage.
Sweet Damson. See Damson.
Swiss Plum. See Suisse.

Thomas, p. 349.
Trouvée de Voueche. Medium or small, oval, violet; juicy, sweet; very good. August.
Turkish Quetsche. See German Prune.

Vert Bonne. See Green Gage.
Victoria, p. 349.
Virgin. Medium, roundish, reddish purple; juicy, sweet; very good. September.
Violet. See Blue Imperatrice.
Violet de Tours. See Early Tours.
Violet Diaper. See Cheston.
Violet Perdrigon. See Blue Perdrigon.
Violet Queen Claude. See Purple Gage.
Violette Hative. See Early Tours.

Wangenheim, p. 349.
Washington, p. 358.
Wax, p. 350.
White Apricot. Medium, roundish, yellow; flesh firm; pleasant—clingstone. August.
White Damson, p. 358.
White Egg, p. 358.
White Empress. See White Imperatrice.
White Gage. See Imperial Gage.
White Holland. See White Egg.
White Imperial. See White Egg.
White Imperatrice. Medium, obovate, bright yellow; juicy, crisp, sweet, translucent; freestone. September.
White Magnum Bonum. See White Egg.
White Mogul. See White Egg.
White Perdrigon. Medium, oval, pale greenish yellow; sweet; clingstone. August.
White Primordian. See Primordian.
Wild Goose. Medium, roundish, oblong, reddish yellow; a good variety of the wild or Chickasaw plum; hardy and productive, and profitable for market where the common plum will not succeed. Midsummer at the Southwest.
Wilkinson. Medium, oval, slightly necked, reddish purple; firm, sweet, not high flavored. September.
Wilmot's Green Gage. See Green Gage.
Wilmot's Late Orleans. See Goliath.
Winter Damson. See Damson.
Woolston's Black Gage. Small, round, dark, rich. September.

Yellow Apricot. See Apricot.
Yellow Egg. See White Egg.
Yellow Gage, English, p. 359.
Yellow Gage, Prince's, p. 359.
Yellow Magnum Bonum. See White Egg.
Yellow Perdrigon. See Drap d'Or.

Zwetsche. See German Prune.

RASPBERRIES.

Allen, p. 444.
American Black-Cap, p. 442.
American White-Cap. See Golden Cap.
Antwerp. See Hudson River Antwerp, Red Antwerp, Yellow Antwerp.
Arnold's Orange. Large, dark orange; excellent. New. Paris, C. W.

Bagley's Perpetual. Medium, oblate, red; sub-acid, poor.
Barnet. Large, obtuse, conic, reddish purple. English. Of little value.
Belle de Fontenay, p. 439.
Belle de Paluau, p. 439.
Brandywine, p. 444.
Brentford Cane. Medium, ovate, dark red. English. Of little value.
Brinckle's Orange. See Orange.
Burlington, or Prosser. Large, firm, sweet, good. New. N. J.

Catawissa, p. 442.
Clarke, p. 439.
Col. Wilder, p. 439.
Cope. Roundish, conical, red; firm, good; growth moderate. Phila.
Cretan Red. Small, deep red; poor. Old foreign sort.
Cushing. Roundish, conical, regular, red; quality good; moderately vigorous and productive. Phila.

Davison's Thornless, p. 442.
Doolittle, p. 442.
Double Bearing. A variety of Antwerp, bearing a second crop, now superseded.
Duhring. Large, crimson; soft; good. Phila.

Ellisdale, p. 442.
Emily. Large; sometimes shouldered; yellow.

Fastolff, p. 439.
Fillbasket, p. 440.
Franconia, p. 440.
French, p. 440.

Ganargua, p. 442.
Gen. Patterson. Large, red. Phila. Dr. Brinckle.
Golden Cap, p. 442.
Golden Thornless, p. 442.

Herstine, p. 444.
Hornet, p. 440.
Hudson River Antwerp, p 441.

Imperial Red. Medium, roundish, scarlet, pleasant. N. J

Joslyn's Improved. See Doolittle.

Kirtland, p. 444.
Knevett's Giant, p. 441.

Large-fruited Monthly, p. 441.
Lum's Everbearing. An autumn fruiting black-cap. Sandusky, O.

Mammoth Cluster, p. 443.
Marvel of the Four Seasons, p. 442.
McCormick. See Mammoth Cluster.
Merveille des Quatre Saisons. See Marvel of Four Seasons.
Miami. See Mammoth Cluster.

Naomi. See Franconia, which it closely resembles, if not identical.
Northumberland Fillbasket. See Fillbasket.

October Red. See Marvel of the Four Seasons.
Ohio Everbearing, p. 443.
Ontario, p. 443.
Orange, p. 442.

Pearl, p. 445.
Philadelphia, p. 445.
Pilate. A dark red, new French sort, of moderate value.
Prince of Wales, Cutbush's. Large, crimson; firm; good. English.
Purple Cane, p. 443.

Red Antwerp. Large, roundish, dark red. Distinct from Hudson River Antwerp. English.

Saunders, p. 445.
Seneca Black-Cap, p. 444.
Souchetti. Rather large; conical, pale yellow, firm; very good, French. New.
Stoever. Large, roundish, conic, bright red, very unproductive. Vt.

Vice-President French, p. 440.

Walker. Rather large, round crimson; soft, good; productive. Pa. Dr. Brinckle.

Yellow Antwerp. Large, light yellow, good. Superseded.
Yellow Cap. See Golden-Cap.

STRAWBERRIES.

Aberdeen. See Roseberry.
Admiral Dundas. Large, irregular, pale scarlet; firm; good, not rich. English.
Agriculturist, p. 419.
Ajax. Large, ovate, dark; good. English.
Albion White. Large, round, nearly white; good. Not productive. Foreign.
Alice Maude, p. 419.
American Scarlet. See Hudson.
Atkinson's Scarlet. See Grove End Scarlet.
Austin Shaker, p. 419.
Austrian Scarlet. See Duke of Kent.

Barnes' Mammoth, p. 419.
Belle Bordelaise, p. 428.
Belle de Vibert. Large, conic, crimson; handsome, firm, not rich. Productive. Foreign.
Bicolor. Medium, oblong, crimson, sweet, good. Dwarf. Productive. Foreign.
Bicton Pine. Large, roundish, white tinged with pink; pleasant but not rich. English. Tender.
Bishop's Orange, p. 424.
Black Defiance, p. 419.
Black Imperial. See Black Prince.
Black Prince, p. 424.
Black Roseberry. Medium, roundish, dark red or purplish; pleasant; moderate bearer. English.
Boston Pine, p. 419.

Boyden's Mammoth. Large, roundish, dark crimson; poor bearer. N. J.
Boudinot. Large, roundish, scarlet; good. Ohio.
Brewer's Emperor. Medium, ovate, dark red; good. English.
Brighton Pine, p. 420.
British Queen, p. 420.
Brooklyn Scarlet, p. 420.
Burr's New Pine, p. 424.
Burr's Seedling. Medium, scarlet, pleasant, hardy, productive. Ohio.
Bush Alpine, p. 427.

Caleb Cope. Large, pointed, scarlet; good.
Captain Cook. Large, resembling British Queen, but smaller, color dark; rich.
Charles Downing, p. 420.
Chili, p. 428.
Chorlton's Prolific. Roundish, necked, light red; good. Staten Island.
Cleveland. Large, cockscombed and conical, deep red; firm; rich, delicious. Staminate. Ohio.
Col. Cheney, p. 424.
Col. Ellsworth, p. 420.
Colfax. Small, round, poor; exceedingly productive and vigorous.
Columbus. Large, roundish, dark red; tender, sweet. Hardy, productive. Ohio.
Cornucopia. Large, conical, scarlet; good. Flushing, L. I.
Cowing's Seedling. Very large, showy, productive. Ind. New.
Cox's Seedling. Large, light red, irregular; rather acid. Late. English.
Crimson Cone, p. 424.
Crimson Favorite. Large, round conic, crimson; flavor fine. Unproductive.
Crystal Palace. Large, conical, regular, glossy scarlet; flesh firm, fine grained; juicy, high flavored. English.
Cushing, p. 420.
Cutter, p. 420.

Deptford Pine. Large, wedge-shaped, bright glossy scarlet; solid, rich, sub-acid. English.
Diadem, p. 425.
Dr. Nicaise. Very large, red; quality moderate. Unproductive. Foreign.
Downer's Prolific, p. 420.
Downton. Medium, ovate, with a neck, dark purplish scarlet; good flavor; poor bearer. English.
Duc de Brabant. Large, conical, scarlet; good flavor. Early. Belgian.
Duke of Kent. Small, scarlet; clear, rich acid. Very early. Superseded.
Dundee. Medium, roundish, scarlet; firm; rich, acid. Scotch.
Durand. Large, irregular, scarlet. Good; not productive. N. J.
Dutchberry. See Crimson Cone.

Early Virginia. See Large Early Scarlet.
Eberlein's Seedling. Medium, conical, dark scarlet; sweet. Early, productive. American.
Elenora. Large, conical, scarlet; acid. Poor bearer. English.
Eliza (Myatt's). Large, obtuse conical, glossy scarlet; excellent. Not productive. English.
Elton. Large, acid, rich. English.

Emma. Large, roundish, crimson; good, productive.
English Red Wood. See Red Wood.

Fillbasket. Very large, roundish, dark scarlet, handsome. Good bearer.
Fillmore, p. 426.
French's Seedling, p. 420.

Gen. Scott. Large, roundish, scarlet; not rich. Vigorous, productive.
Genesee, p. 420.
Georgia Mammoth, p. 420.
Globe. Large, round, scarlet; excellent. English.
Golden Seeded. Large, dark, early. Succeeds well in some places.
Goliath, p. 420.
Green Prolific, p. 426.
Green Strawberry. Small, round, whitish, tinged reddish brown; flesh solid, greenish, juicy, rich. Late.
Grove End Scarlet. Medium, round, scarlet; acid. Early. English.

Hathaway, p. 420.
Hautbois, p. 424.
Hooker, p. 420.
Hooper's Seedling. Medium, conical, deep crimson; rich, sweet. English.
Hovey's Seedling, p. 426.
Hudson, p. 426.
Huntsman. Large, roundish, scarlet; poor. Productive.

Ida, p. 426.
Iowa, p. 420.

Jenny Lind, p. 421.
Jenny's Seedling, p. 426.
Jucunda, p. 421.

Keen's Pistillate. Medium, conical, dark red; acid, sprightly. English.
Keen's Seedling, p. 421.
Kentucky, p. 421.

La Constante, p. 422.
Ladies' Pine. Small, round, pale red; excellent. Canada. Pistillate.
Lady Finger. Medium, oblong conical, dark scarlet; good. N. J.
Large Early Scarlet, p. 422.
Late Prolific. Medium, scarlet. Good, productive. Late.
Le Baron, p. 422.
Lennig's White, p. 422.
Lizzie Randolph. Medium, roundish, crimson; poor flavor.
Longworth's Prolific, p. 422.

Mammoth. Large, roundish, crimson. Poor, unproductive. English.
Marguerite. Large, long conic, pale scarlet; rather insipid, handsome, showy; feeble grower.
Marylandica. Large, dark crimson; firm. Staminate. Md.
Matilda, p. 422.
McAvoy's Extra Red, p. 426.
McAvoy's Superior, p. 426.
Mead's Seedling. Medium, long, conical; good. N. J.
Melon. Medium, round, dark; worthless. Scotch.
Metcalf's Early. Small, roundish; scarlet; mild acid. Michigan.
Methven Scarlet. Large, roundish, dull scarlet; soft, of poor flavor; discarded. English.
Michigan. A seedling of the Wilson, ten days later. New.

Monarch of the West, p. 422.
Monitor, p. 422.
Monroe Scarlet, p. 426.
Montevideo Pine. Large, conical, late. Staminate. L. I.
Mottier's Seedling. Large; acid. Productive.
Moyamensing, p. 426.
Myatt's Eliza. See Eliza.

Napoleon III., p. 422.
New Jersey Scarlet. Medium, conical, necked, light scarlet; good. N. J.
Neck Pine, p. 427.
Nicanor, p. 422.

Old Pine. Medium, conical with a neck, scarlet; solid; juicy, rich.
Omer Pacha. Large, roundish, bright red; solid, juicy, sweet. Strong and prolific. Foreign.
Orange Prolific. Large, roundish, necked, crimson; acid. Rochester, N. Y.

Peabody, p. 427.
Pennsylvania, p. 427.
President Wilder, p. 422.
Prince Albert. Medium, conical, dark crimson; rich. Not productive. English.
Prince of Orleans. Medium, roundish, dark. Poor bearer.
Prince of Wales. Large, glossy red; solid; delicate, acid. English.
Prince's Climax, p. 427.
Prince's Magnate. Large, round, scarlet; rich. Productive, hardy, vigorous. L. I.
Prolific, p. 428.
Profuse Scarlet. Medium, scarlet. Productive.
Pyramidal Chilian. Medium, conical, scarlet. Bears long. N. J.

Red Alpine, p. 427.
Red Bush Alpine, p. 427.
Red Wood, p. 428.
Richardson's Early. Medium, conical, crimson; good. Early. Unproductive.
Richardson's Late. Large, roundish, scarlet; sprightly; good.
Rippawam. Large, round conical, sometimes irregular; scarlet; barely good. Moderately productive.
Rival Hudson, p. 427.
Roseberry. Rather small, ovate, scarlet. Poor bearer. English.
Ross Phœnix, p. 423.
Ruby. Medium, ovate, bright red; juicy, rich, excellent, not very hardy. English.
Russel, p. 427.

Scarlet Cone, p. 427.
Scarlet Melting. Medium, conical, scarlet; tender, not rich. Productive.
Scarlet Nonpareil. Large, roundish conical, bright red; rich, high flavor. English.
Schiller. Medium, conical, dark red; rich, sub-acid. Unproductive. German.
Scotch Runner. Small, oval; scarlet; good.
Scott's Seedling, p. 423.
Sir Charles Napier. Large, roundish coxcombed, scarlet; musky. English.
Sir Harry. Large, coxcombed, dark red; solid, juicy. Very good. English.
Southborough Seedling. Medium,

ovate, conic, scarlet; firm; mild, rich. English.

Stinger's Seedling, p. 423.

Swainstone's Seedling. Large, ovate, light glossy scarlet; very good. A poor bearer. English.

Triomphe de Gand, p. 423.

Trollope's Victoria. See Victoria.

True Chili. Large, ovate, red; flesh firm; sweet, of indifferent flavor. Late.

Unique Scarlet. Large, light scarlet; sweet, rich. Poor bearer.

Vicomtesse Hericart de Thury, p. 423.

Victoria, p. 423.

Walker's Seedling, p. 424.

Washington. See Iowa.

Western Queen, p. 427.

White Alpine, p. 427.

White Bush Alpine, p. 427.

White Wood, p. 428.

Willey, p. 427.

Wilmot's Superb. Large, roundish, scarlet; coarse, not rich. English.

Wilson's Albany, p. 424.

Wizard of the North. Rather large, dull red; soft, not rich. Scotch.

Yellow Chili. Very large, irregular, yellow with a brown cheek; flesh very firm; rather rich.

York River Scarlet. See Hudson.

Young's Seedling. See Germantown.

GLOSSARY

Of the more common terms used in Fruit Culture.

Acute, sharp or angular.

Acuminate, drawn out to a point.

Alburnum, the sap-wood, as distinguished from the heart-wood.

Apex, point, the part of a fruit furthest from the foot-stalk.

Base, lower end, or that portion of a fruit, stalk, or part of a plant, nearest the supporting part or root.

Basin, the hollow or depression at the apex or crown of a fruit, surrounding the calyx.

Bezi, a wilding, or natural seedling.

Beurré, a buttery pear.

Border, artificial bed of enriched earth.

Callus, ring or swollen portion formed at the base of a cutting by the descending cambium.

Calville-shaped, much ribbed, as applied to apples.

Calyx, the outer or green leaves of a flower, which remaining on the apex of a pear or apple, are often denominated the eye.

Cambium, the soft, newly forming wood beneath the bark.

Canes, long, bearing shoots; applied to grapes and raspberries.

Clipping, trimming down to some definite shape.

Colmar-shaped, pyriform or pear-shaped, with a rather slender neck and large body.

Conical, tapering regularly towards the apex.

Cordate, heart-shaped.

Cockscomb, applied to the form of strawberries when much compressed at the sides.

Crenate, notched or cut like rounded or blunt saw teeth.

Crown, the part of a fruit furthest from the foot-stalk or base.

Curculio, the insect which stings young fruit.

Dwarfs, trees made diminutive by grafting or budding upon stocks of small growth.

Espalier, a tree trained flat upon a trellis.

En quenouille, training to produce fruitfulness by tying the branches downwards.

Fibrous roots, the smaller, branching, or thread-like roots.

Forcing, the early ripening of fruits by artificial heat under glass.

Fore-right shoot, the terminal shoot of a branch.

Head back, to cut off the limbs of a tree, part way down.

Head down, to cut off the entire limbs or branches of a tree, or to cut down to an inserted bud.

Inflorescence, the manner in which the flowers are borne.

Lay-in, applied to selecting and fastening to a trellis or wall, new branches or shoots.

Lay-in by the heels, to bury the roots of trees temporarily in a trench.

Leading shoot, the longest or main shoot of a limb or tree.

Lopping, cutting the branch down to the stem.

Maiden plant, a tree of one year's growth from the bud or graft.

Mulching, covering the ground about a tree with straw or litter. to prevent drying.

Oblate, flattened, so that the shortest diameter is between the base and apex, like a flat turnip.

Obovate, reversed ovate, being largest from the foot-stalk or towards the apex.
Obtuse, rounded or blunt.
Ovate, egg-shaped, being the largest towards the foot-stalk.
Pedicel, the subdivision of a flower or fruit-stalk.
Peduncle, the flower or fruit-stalk.
Petals, flower-leaves, usually colored.
Petiole, leaf-stalk.
Pinch-in, to stop the growth of a shoot by pinching off the tip.
Pippin, an indefinite term applied to various apples, differing in size, shape, color, and flavor, but more particularly used for the Newtown Pippin.
Pomology, the science of fruits.
Pyramidal, like a pyramid, usually nearly similar to conical, but longer.
Pyriform, pear-shaped, having more or less a drawn-out neck.
Ringing, the removal of a ring of bark round a branch, to impede the descending sap.
Serrate, notched or cut like saw-teeth.
Shanking, a diseased shrivelling of the foot-stalks of grapes.
Shorten-in, to cut off more or less of the outer parts of shoots.
Spongiole, the minute spongy extremity of a fibrous root.
Sport, an unusual departure of variation in a new seedling.
Spur, a short stubby shoot, bearing fruit or fruit-buds.
Standard, a fruit tree in open ground, or not trained to a wall or trellis.
Stock, seedling tree which supports the inserted bud or graft.
Stop, to pinch or cut off the point of a shoot, to prevent its further extension in growth.
Strike, to emit roots.
Tap-root, the main or central descending root.
Trellis, an upright flat frame, for training fruit trees and grapes upon its face.
Wilding, a natural seedling.
Work, a term applied to the budding or grafting of trees.

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